OBSERVATIONS

ON THE

DISEASES OF THE ARMY

IN

JAMAICA.

OBSERVATIONS

ON THE

DISEASES OF THE ARMY IN JAMAICA;

AND ON THE

BEST MEANS OF PRESERVING THE HEALTH OF EUROPEANS, IN THAT CLIMATE.

BY

JOHN HUNTER, M.D. F.R.S.

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AND PHYSICIAN TO THE ARMY.

THE SECOND EDITION, WITH AN APPENDIX.

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TO

SIR GEORGE BAKER, BART.
PHYSICIAN TO THEIR MAJESTIES,
PRESIDENT OF THE COLLEGE OF PHYSICIANS,
AND F.R.S.

AND

WILLIAM HEBERDEN, M.D. F.R.S.
AND FELLOW OF THE COLLEGE OF PHYSICIANS.

GENTLEMEN,

THE intereſt you were pleaſed to take in my appointment to the office, in which I had an opportunity of making the obſervations contained in the following pages, will be deemed, I hope, a good reaſon for addreſſing you on the preſent occaſion. It is indeed with the greateſt pleaſure, that I ſeize this opportunity of acknowledging the great obligations, which I owe to your friendſhip. The zeal with which you have ſucceſsfully laboured in the improvement of medical knowledge, is equally honourable to yourſelves, and beneficial to the public. That you may long continue to ſet an example ſo worthy of imitation, muſt be the ſincere wiſh of all who know you, and of none more than,

GENTLEMEN,

Your much obliged,

and moſt humble Servant,

Charles Street,
April 3d, 1788.

JOHN HUNTER.

PREFACE.

THE following obſervations were made, while I had the care and ſuperintendance of the military hoſpitals in the iſland of Jamaica, from the beginning of the year 1781 till the month of May 1783.

The dreadful mortality, that has always accompanied military operations in the Weſt Indies, in conſequence of ſickneſs and diſeaſe, renders every attempt to point out the cauſes of ſuch calamities, and the means of obviating them, an object worthy of the public attention. In treating of this ſubject, I have confined myſelf to an account of thoſe things only, that fell under my own obſervation. This I have not done, as undervaluing the labours of others; but from a conviction that in Phyſic, as in all other branches of natural knowledge, he who ſhall content himſelf with narrating what he has ſeen, will perform a work more likely to be uſeful towards the improvement of knowledge, than if he endeavoured to add to the value of his own labours, by collecting the opinions of others, which there is ſome danger of his miſtaking, or miſrepreſenting.

There is much ſimilarity among the diſeaſes of warm climates; and the *Remittent Fever* appears to be the diſorder which prevails chiefly in all of them. That diſeaſe, as deſcribed on the coaſt of Africa *, and on the banks of the Ganges †, would ſeem to be nearly the ſame as in Jamaica. It is therefore probable that the method of cure, which was found ſucceſsful in that iſland, would anſwer equally well in thoſe, or ſimilar climates: but this can only be determined by experience.

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* See Robertſon's Phyſical Journal kept on board his Majeſty's ſhip RAINBOW, Part I. cap. 1 and 2.

† See Clark's Obſervations on Voyages to the Eaſt Indies, p. 168, caſe VI et ſeq.

March 10th, 1796.

In this ſecond edition there is no material alteration from the firſt; for that containing the reſult of my obſervations while in Jamaica, and not having had any opportunities, ſince I left the iſland, of extending my knowledge of the diſeaſes chiefly treated of in this Volume by farther experience, it muſt be obvious that there can be no room for alteration. Such illuſtrations and additions as I have judged proper to make, I have ſubjoined in the form of notes in the Appendix.

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ERRATUM.

Page 216, line 5, from the bottom, for *Choliera* read *Cholera*.

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OBSERVATIONS
ON THE
DISEASES OF THE ARMY
IN JAMAICA.

INTRODUCTION.

Of the Situation, Face of the Country, Climate, and Produce of the Iſland of JAMAICA.

THE iſland of Jamaica lies in north latitude, between 17° 44′ and 18° 40′; and in longitude weſt from London, between 76° and 78° 30′. It is of an oval figure, one hundred and fifty miles long from eaſt to weſt nearly, and about fifty miles over, where it is broadeſt *.

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* The length, breadth, and ſituation of the iſland are not aſcertained with any tolerable degree of accuracy. There is a difference of twenty miles between the beſt maps that we yet have of the iſland. Vid. Craſkell's Survey, Bellin, the Weſt India Atlas by Jefferys, and Long's Hiſtory of Jamaica.

It is very mountainous, like moſt of the other Weſt India iſlands. There are flat lands towards the coaſt almoſt all round the iſland, but they ſeldom extend more than a few miles into the country, and the mountains riſe with a ſteep aſcent to a great height. They are covered in moſt places with woods to their ſummits. There is a chain of them that runs from one end of the iſland to the other. The appearance of them is ſingular, their ſides conſiſting of prominent ridges and deep gullies, formed by the immenſe torrents of water that ruſh down them, after heavy falls of rain. Their tops are commonly covered with clouds, which often hang half way down their ſides, preſenting a moſt picturesque appearance. Towards the eaſt end of the iſland, where they are higheſt, they are called the *blue mountains*. Their greateſt height is 7,553 feet above the level of the ſea*. On the ſummit of the blue mountain peak, the higheſt land in the iſland, the thermometer was found to range from 47° at ſun-riſe to 58° at noon, in the month of Auguſt *.

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* Their height was determined by geometrical meaſurement by Mr. George Gould, in the year 1773, who was employed by the government at that time, in making ſurveys in that part of the world. In the meaſurement allowance is made for the curvature of the earth, &c.

The heat is greateſt in the low lands along the ſea-coaſt, on the ſouth ſide of the iſland. The thermometer, in the months of May, June, July, Auguſt, and September, ranges from 85° to 90° between one and two o'clock of the afternoon, which is the hotteſt time of the day. During the other months of the year the heat is about five degrees leſs in the day-time; but the difference in the temperature of the nights is much more conſiderable: for, in the hot months, the thermometer ſeldom falls lower than 80° in the night-time; whereas, in December, January, February, and March, the coldeſt months in the year, it often deſcends to 70°, and I once ſaw it as low as 69° about ſun-riſe, which is the coldeſt time in the twenty-four hours. Theſe obſervations were made in the town of Kingſton †.

As you aſcend the mountains, the heat diminiſhes; at Stoney Hill, which is ten

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* Med. Comment. Edin. 1780, p. 248.

† The thermometers uſed were made by Mr. Ramſden, and divided according to Fahrenheit's ſcale.

miles from Kingſton, and at no great height in the mountains, there is a difference of nearly ten degrees in the temperature; at Cold Spring *, the difference is not much leſs than 20°. In the intermediate ſituations there is a delightful variety of climate, which few countries can boaſt of; and in the ſmall valleys, that lie among the mountains, ſo temperate is the air, that apples, ſtrawberries, and other European fruits are cultivated with ſucceſs, and alſo the ſame vegetables that are produced in the gardens of England †.

The winds between the tropics, blow from eaſt to weſt, as is well known, following the courſe of the ſun. In the day-time they blow ſteadily in the iſland of Jamaica, making allowance for changes produced in their courſe

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* Cold Spring is about 4000 feet above the level of the ſea; and the top of St. Catharine's mountain is 5050 feet, according to the geometrical meaſurement of Mr. George Gould.

† See a paper *on the Heat of Wells and Springs in the Iſland of Jamaica, &c.* publiſhed in the Philoſophical Tranſactions for 1788, page 53.; which, from the immediate relation it has to the temperature of the iſland of Jamaica at different heights above the level of the ſea, and alſo from its containing an eaſy and expeditious method of aſcertaining the mean temperature of any country, I have re-printed in the Appendix.

by the ſhape and figure of the land; but during the night, the cold air condenſed on the tops of the mountains ruſhes down, and forms what is called the land breeze. Theſe alternate changes greatly refreſh the air, and render the heat leſs inſupportable. In the months of November and December there are north winds, which ſometimes prevail for ſeveral days together, and blow all the way from the continent of North America. They are ſeverely felt on the north ſide of the iſland, and even paſs the lofty mountains, and blow for days together on the ſouth ſide.

The months of Auguſt, September, and October, are called the hurricane months, as violent ſtorms of wind and rain happen in them. In ſuch ſtorms the wind does not blow in one direction, but in furious guſts, and whirlwinds from every quarter; and the weight of water giving additional force to the velocity of the winds, they ſtrip the trees of their leaves and branches, or tear them up by the roots; deſtroy the produce of the lands, throw down houſes; and leave the country an uniform waſte. It is almoſt incredible, what weighty and ſolid bodies are moved to great diſtances; and ſuch examples of this are produced as would not meet with belief, were they not authenticated beyond a doubt. In the year 1780, on the 3d of October, the weſt end of the iſland was rendered almoſt a deſart by a ſtorm of uncommon violence, which did little or no damage in the other parts of the iſland. Previous to that period, Jamaica had not ſuffered materially from ſtorms during the ſpace of thirty-ſix years; but from that time, for ſix ſucceſſive years, excepting the year 1782, one quarter of the iſland or another was greatly injured by violent ſtorms.

The year is divided into the dry and rainy ſeaſons. The rains are expected in May, and October, but they are by no means regular. Of the annual rains much the greater proportion falls in the ſix months that elapſe from the middle of May to the middle of November, and amounts probably to more than three quarters of the whole. The heavieſt rains come from the ſea, and ſometimes continue inceſſantly one or more days, during which a prodigious quantity of water falls. The lighter ſhowers come from the mountains, and for many days together return nearly at the ſame hour[*]. The warm winds blowing from the ſea, ſtrike againſt the lofty mountains; the vapour with which they are loaded is condenſed into clouds, which after accumulating for ſome time fall back upon the low lands, and there deſcend in ſhowers. Much thunder uſually accompanies this proceſs, but it ſeldom does any miſchief, for the ſummits of the mountains appear to ſerve as conductors in carrying it to the earth. The high grounds ſeldom ſuffer from want of rain, though along the ſea-coaſt the country is often parched up.

There are many rivers running in all directions from the mountains, but none navigable except Black River. They are very rapid, and when heavy rains fall in the mountains, pour down an immenſe torrent of water. Some of them bury themſelves ſuddenly under ground, and after a little break out as abruptly; though there are others that cannot afterwards be traced. There are alſo examples of large ſtreams of water burſting all at once from the ground; and it is probable, that among ſuch lofty mountains, there are many ſubterraneous paſſages for water. There are few places in the low lands, to which a ſtream of water might not be conducted; but this is not much practiſed as yet in the cultivation of the ground, and wells or tanks in moſt places ſupply water for domeſtic purpoſes.

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[*] What is here ſaid of the rains is to be underſtood as applying chiefly to Kingſton, and that neighbourhood. The quantity that falls annually is between 60 and 70 inches.

The ſky is rarely obſcured with clouds, except during the rainy ſeaſons; the nights are uncommonly clear, and the moon and ſtars ſhine with a brightneſs many degrees ſuperior to what is ſeen in Europe. The riſing and ſetting ſun gilds the horizon with the moſt beautiful tints and colours, and exhibits a ſcene the moſt ſplendid in nature.

The ſoil, where it is not rocky*, is in general fertile. The iſland is well ſupplied with proviſions of every kind, and could eaſily raiſe more than ſufficient for the inhabitants; but the cultivation of the ſugar-cane is ſo lucrative, that every exertion is turned that way, and many articles are imported, which might either be raiſed in the iſland, or their room amply ſupplied by others the produce of the country.

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* The bare honey-comb rock, which is every where to be met with, is calcareous; and the honey-comb appearance of the ſurface proceeds from the air and rain acting upon, and carrying off the ſofter parts, while they leave the harder.

The beef and mutton are good, and the pork is excellent. Greens, and eſculent roots of various kinds, are plentiful, and in great perfection. The tropical fruits, wherever a little care is taken of them, are fine and delicious. Along the coaſt, and in the rivers, there is great variety of excellent fiſh. The poultry is of the beſt kind, and there is alſo plenty of wild fowl at particular ſeaſons of the year.

CHAP. I.

SECT. I. *Of the Cauſes of Sickneſs and Mortality, among Soldiers and Europeans, in Jamaica.*

FROM the firſt diſcovery of the Weſt Indies to the preſent time, all expeditions and emigrations to that part of the world have been attended with great mortality. Columbus and his companions ſuffered ſeverely, and ſucceeding adventurers have not been more fortunate. The firſt military expedition of any conſequence, that went from this country to the Weſt Indies, was ſent againſt Hiſpaniola by Oliver Cromwell; but failing in an attempt upon that iſland, they attacked Jamaica with better ſucceſs. The far greater part of them in a ſhort time periſhed by ſickneſs. The unfortunate expedition againſt Carthagena is ſtill remembered, not leſs from the mortality that attended it, than from its ſailure: and though this country, in a ſubſequent war, was more fortunate in their attempts upon Martinique, Guadaloupe, and the Havannah, yet it is a melancholy truth that, there were few of the conquering troops alive ſix months after their victories.

Great loſſes of a later date have been ſuſtained in the war juſt concluded*, particularly at St. Lucia, Jamaica, and on the Spaniſh Main. Four regiments were ſent from England in 1780 to Jamaica; they arrived there the 1ſt of Auguſt, and before the end of January enſuing, not quite ſix months, one half of them nearly were dead, and a conſiderable part of the remainder were unfit for ſervice. Notwithſtanding theſe repeated loſſes, and the Weſt Indies having been a principal ſeat of war during the two laſt ruptures between this country and France, and being likely to become ſo again in caſe of another war, no ſteps have been taken to guard againſt the mortality, none at leaſt adequate to the importance of the object; and the uſeful experience of one war has been loſt before the commencement of another. It would ſeem to be a proper time, at the concluſion of the preſent, to collect the uſeful leſſons we have ſo dearly purchaſed, and to learn from them how to prevent ſimilar miſfortunes in future. The means of obtaining an object ſo deſirable will be better underſtood, and may be more effectually carried into execution, from an acquaintance with the common cauſes of ſickneſs, and mortality in the Weſt Indies.

---

* In 1783.

The diſorders that prove fatal to ſoldiers, and Europeans in general in the Weſt Indies, are of two kinds, namely fevers and fluxes. They are the concomitants of armies in all parts of the world, but in tropical climates they rage with peculiar violence. There appears to be an intimate connection between them, for they are frequently combined together, often interchange with each other, and it rarely happens that one is epidemic without the other. They would ſeem to depend upon the ſame cauſe, perhaps differently modified. The fevers are ſimilar to what have been called marſh, and remittent fevers; but more formidable in their attack, quicker in their progreſs, and much more fatal in their termination, than what are ſeen in Europe. They proceed from the ſame cauſe, noxious exhalations from wet, low, and marſhy grounds. That ſuch vapours are a cauſe of fever, has been confirmed by repeated experience and obſervation, in all parts of the world.

Towards the production of ſuch noxious vapours, there appears to be wanting the concurrence of three circumſtances; heat, moiſture, and decayed vegetable or animal matter. The heat of tropical climates, though generally reputed the cauſe of their unhealthineſs, will not alone produce fevers, as is ſtrongly exemplified in thoſe living on board of ſhip, who remain free from fevers; and alſo in the inhabitants of certain dry ſandy ſpots along the coaſt, in which the heat is uncommonly great, yet the ſituations are healthy, as Fort-Auguſta, Port-Royal, and others.

Simple moiſture is harmleſs*, at leaſt as far as relates to the production of fevers, of which the two laſt-mentioned places may likewiſe be given as examples, for they are nearly ſurrounded with water on all ſides. It is true, the air is perfectly clear; yet it muſt be loaded with moiſture, in conſequence of the great heat of the ſun acting upon the water. But the vapour ariſing from water is harmleſs, even when rendered more an object of our ſenſes, by being condenſed into fogs and clouds. Thus, the pariſh of St. Thomas's in the Vale is every night covered with a thick fog, owing to the rivers which paſs through it ſending forth vapours, which in the day-time are perfectly tranſparent; but towards evening, by the cool air coming from the neighbouring mountains, they are condenſed, and remain viſible till next day's ſun diſperſe them, without however being at all unwholeſome.

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* Vid. Med. Tranſ. vol. ii. p. 521.

Dead vegetable and animal matter do not ſend forth noxious vapours, unleſs in a ſtate of corruption, for which a certain degree both of heat and moiſture is neceſſary. In northern climates, the heat is not ſufficient till ſummer to raiſe noxious exhalations from ſwampy grounds; but in Jamaica ſuch are produced all the year round from wet and marſhy places, which are always found to be unhealthy, as are alſo thoſe places lying to leeward of them. The dry part of the country continues healthy during the hot weather, but as ſoon as the rains ſet in it becomes unhealthy. After heavy falls of rain, every part of the flat country ſeems to exhale the ſame noxious vapours as marſhes; for the moiſture never fails to meet with ſufficient quantity of decayed vegetable or animal matter, dried and preſerved by the preceding heat.

In dry ſandy ſpots, nearly ſurrounded by the ſea, there is little or no decayed vegetable or animal matter; and there is no moiſture, for the rain is immediately abſorbed by the ſand: ſuch places therefore are healthy, and almoſt exempt from fevers. Elevated and mountainous ſituations are alſo healthy, for what there is of decayed vegetable and animal matter is waſhed away by the frequent rains, which do not penetrate the ground, but in running off carry whatever is light and looſe along with them. What is thus carried off, is frequently depoſited in the valleys among the hills; but thoſe are ſo ſmall, that they do not form a bottom large enough to emit vapours hurtful in any great degree: add to this, that the inhabitants never ſet down their houſes in ſuch bottoms, but conſtantly make choice of a lofty ſituation. How much it contributes to health, being raiſed even a little above the exhalations, may be judged from this, that in the flat part of the country the houſes upon a level with the ground, or but little raiſed above it, are uniformly the moſt unhealthy.

If any doubts be entertained, that the exhalations from wet and marſhy grounds are the cauſes of fevers in Jamaica, attention to the following facts cannot fail to remove them. Ships lying at Port Royal, with their men in perfect health, on moving higher up the harbour, either oppoſite to Kingſton, Rock Fort, or beyond them, and taking their ſtation in any of theſe places, have in a few days become ſickly. The men have been ſeized with fevers, owing to the low ſwampy lands along the ſhore, and at the head of the harbour, from which laſt the exhalations are carried every morning towards the ſhips, when the regular ſea breeze ſets in, as is ſenſibly perceived by the bad ſmell which accompanies it. In the year 1782, two frigates moored at the head of the harbour, to guard againſt an attack in that quarter, were obliged to leave their ſtation in a fortnight, on account of ſickneſs, though few of their people had been permitted to go on ſhore during that time. The ſhips of war do not go ſo high up to take in their water, but, the place being wet and ſwampy, it commonly happens that the men employed in filling the water caſks are taken ſick, either at the time, or a few days after; and there are examples where, out of ſixty or ſeventy men ſent on that duty, not one has eſcaped a fever.

In this particular caſe however, there are concurring circumſtances, that give additional force to the original cauſe, the principal of which is intoxication from rum. This has been remarked as ſo pernicious, that it has become an opinion with many, that it is the principal cauſe of ſickneſs in the Weſt Indies. But there is no good ground for this, for rum does not appear to poſſeſs any ſpecific power of producing remittent fevers or fluxes, more than other ardent or rectified ſpirits, which of themſelves are never known to occaſion thoſe diſeaſes*. It is further to be obſerved, that rum is drank with impunity as far as regards fevers, whenever the cauſes above-mentioned are not preſent, or the intoxicated perſon is not expoſed to them. The men on board the two frigates drank as much rum while lying at Port-Royal, as when ſtationed at the top of the harbour; yet in the former ſituation they were perfectly healthy, and in the latter extremely ſickly. The pernicious effects of rum are to be imputed to its weakening the powers of digeſtion in the ſtomach, and the conſtitution in general; but ſtill more to its giving riſe in a ſtate of intoxication to exceſſes and irregularities, ſuch as walking or running violently in the ſun, lying down in the open air during the heat of the day or damps of the night, and going to ſleep in thoſe ſituations. Such things of themſelves, without previous intoxication, concur powerfully in rendering fevers both more violent, and more frequent.

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* Vide Pringle, Diſ. of Army, ed. 7th, p. 87.

The following particulars are likewiſe found to have equally pernicious effects as rum; fatigue, hard labour, bad or ſcanty diet, long faſting, and diſtreſs of mind of all kinds. Every thing indeed that any how weakens or exhauſts the body, would ſeem to co-operate powerfully in giving force to the original cauſe of fever. Expoſure to rain, and thereby getting wet, by which the body is chilled, is found to be productive of fevers in Jamaica. All the circumſtances, or the greater part of them, juſt mentioned, attend ſoldiers on actual ſervice; and if we take into conſideration the difficulty, nay often the impoſſibility of having proper care taken of the ſick in ſuch ſituations, ſome opinion may be formed of the cauſes of that dreadful mortality, that has uniformly attended the armies of Europeans in the Weſt Indies.

It is farther to be remarked, that thoſe who are juſt arrived from cool and healthy climates, are particularly ſubject to fevers, as is daily experienced by all new comers. A regiment always loſes a greater proportion of men the firſt year than afterwards, ſuppoſing their ſituation to be the ſame. The great and ſudden heat, which renders the body feeble and languid, no doubt contributes to this; but it is chiefly to be aſcribed to this circumſtance, that the human frame acquires by habit a power of reſiſting noxious cauſes, as is ſeen every day in the uſe of opium, ardent ſpirits, and almoſt all poiſonous ſubſtances. Hence Europeans, after remaining ſome time in the Weſt Indies, are leſs liable to be affected by the cauſes of fevers than on their firſt arrival. Even in England it has been obſerved, that ſuch as move from an healthy part of the country, into one that is low and full of ſwamps, ſuffer more than the original inhabitants. The negroes afford a ſtriking example, of the power acquired by habit of reſiſting the cauſes of fevers; for, though they are not entirely exempted from them, they ſuffer infinitely leſs than Europeans. There was the ſtrongeſt proof of this in the negroes who were ſent along with the troops againſt Fort *St. Juan*, of whom ſcarcely any died, although few or none of the ſoldiers ſurvived the expedition.

It is a circnmſtance univerſally remarked, that there is a great difference in the degrees of health enjoyed by the men, and the women, in the Weſt Indies, I mean Europeans and their deſcendants. The life of a woman is at leaſt twice as good as that of a man, to ſpeak in the terms of thoſe, who make ſuch things matter of calculation. This is owing to their keeping much within doors, or going out only in the cool of the morning or evening, and even then in a carriage; and to their uſing no violent exertions in the open air, whereby they are little expoſed to the cauſes of fevers, againſt which they are further guarded by their regularity and temperance in living. During the war there was a claſs of females, who had it not in their power to uſe ſome of the above precautions, and neglected others, that ſuffered as much as the men, I mean the wives of the common ſoldiers. The temperance of the women proving ſome ſecurity againſt fevers, it will naturally be ſuppoſed, that the intemperance of the men renders ſuch diſorders more frequent; and doubtleſs it is ſo. But an abſtemious diet in men obliged to lead an active life, and to be much in the open air, is far from being a preſervation againſt the diſeaſes of the country: on the contrary, thoſe who live well are obſerved to enjoy the beſt health; and it may be given as a general rule, that ſuch as are not guilty of exceſs in this country, ought not to follow a ſtricter regimen on going to the Weſt Indies, but rather make a ſmall addition to their uſual quantity of wine.

SECT. II. *Of the Precautions to be taken in ſending Troops to the Weſt Indies; and of the Means of preſerving their Health in that Climate.*

IN treating of the means of preſerving the health and lives of ſoldiers, I ſhall mention the circumſtances conducive thereto, in the order they preſent themſelves, in ſending troops from Europe to the Weſt Indies.

I. The troops to be ſent ſhould conſiſt of well-diſciplined and not new-raiſed men; for the latter being leſs orderly, and not accuſtomed to the life of a ſoldier, are more liable to diſeaſe from the neceſſary confinement on board the tranſports on their paſſage, and ſuffer greatly more from the climate than men habituated to diſcipline, as was obſervable in all the young regiments ſent to that part of the world. Beſides, it is almoſt impracticable to diſcipline men in a country, in which they have ſo many difficulties to encounter, and where the great heat renders it impoſſible to exerciſe them in the open air, except for a ſhort time in the morning or evening; and there is even a conſiderable objection againſt the evening exerciſe, which I ſhall have occaſion to mention afterwards.

II. The men ſhould be embarked at a proper time of the year, that is, about the end of September *; in order that they may arrive in the Weſt Indies both at the cooleſt, and moſt healthy ſeaſon of the year. The inconveniencies and difficulties, neceſſarily accompanying a change of country, will be felt much leſs, if it take place at an healthy than at a ſickly ſeaſon. By this precaution, the troops, when intended for a garriſon to any of our iſlands, will get accuſtomed to the climate before the ſickly ſeaſon commences. If they are deſigned for an expedition, it becomes of the utmoſt conſequence that they ſhould be diſpatched from England at the proper time; and they ought to proceed directly to the place of deſtination, without touching at any of our iſlands, where they ſeldom fail to contract much ſickneſs. If however it be abſolutely neceſſary to ſtop at one or other of the iſlands, to be ſupplied with labouring negroes, or for other purpoſes

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* See note A in the Appendix.

that the ſervice may require, the troops ſhould be kept on board the tranſports; and the tranſports ſhould be anchored in an healthy ſtation, that is, at a diſtance from, and not to leeward of, marſhy ground. By neglecting the above precautions, expeditions otherwiſe judiciouſly planned, have proved unſucceſsful from the ſickneſs merely and conſequent mortality, with little or no oppoſition on the part of the enemy.

III. When the troops are embarked, which they ſhould be on board of roomy tranſports, the utmoſt attention ought to be paid by the officers, to keep the men clean both in their perſons and berths. This is done by dividing them into two or more watches, and making them come regularly upon deck every day with their bedding; alſo by ſcraping, ſmoaking, and cleaning between decks daily, and by waſhing their cloaths once or twice a week. So great improvements have been made of late years by Captain Cook, Sir John Pringle*, and others, in preſerving the health of perſons at ſea, and the knowledge of them is ſo generally diffuſed, that we ſeldom hear of ſuch mortality raging on board our ſhips as formerly: yet there are not wanting inſtances of the dreadful effects of neglecting cleanlineſs, and other precautions, even in the war juſt concluded. It is no ſmall advantage, in ſending troops to the Weſt Indies, to land them with their health unimpaired, and adds greatly to their chance of living in that climate.

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* Diſcourſe upon ſome late improvements of the means for preſerving the health of mariners.

IV. When the troops arrive in the Weſt Indies, they ſhould be quartered in barracks erected in healthy ſituations. Whenever there is not ſufficient room in the barracks, which almoſt always happens in time of war, and houſes cannot be hired that are healthy as to ſituation, the men ſhould remain on board the tranſports, till ſome temporary buildings are erected; for the air at ſea is pure and healthy, and productive of none of the diſeaſes of the country. It has always been found moſt fatal to encamp troops in the Weſt Indies, and ſhould never be done but on actual ſervice.

In regard to healthy ſituations for barracks, there was occaſion to mention, in ſpeaking of the cauſes of ſickneſs, ſuch places as were found to enjoy particular advantages in reſpect to health. They are of two kinds in Jamaica, and are moſt probably the ſame in all the other iſlands; namely, dry ſandy peninſulas or iſlands near the ſhore, and elevated ſituations in the mountains. As examples of the former may be mentioned Port-Royal, and Fort-Auguſta. Port-Royal has always been conſidered as more healthy than either Spaniſh-Town, or Kingſton; and has accordingly been reſorted to by invalids from both thoſe places. In the years 1781 and 1782, there was a ſtriking proof of the ſalubrity of the air at Fort-Auguſta. A corps of loyal Americans, under the command of Lord C. Montagu, were quartered there upwards of nine months, in which time they loſt only two men, and their ſick ſeldom amounted to twenty*.

Of elevated and mountainous ſituations it may be obſerved, that they are more uniformly healthy than dry and ſandy places upon the coaſt; for the neighbourhood of marſhy ground, or ſtagnant water, often renders theſe laſt unhealthy. From a circumſtance of this kind, the troops at Fort-Auguſta became ſubject to fevers in the year 1783. The ſea riſing higher than uſual, overflowed the whole of the ground on which the fort ſtands, near a foot above the ſurface in ſome places, and on ebbing left much ſlime and ooze. A few days after this happened, many of the men were ſeized with fevers*. At no great height in the mountains, there is a conſiderable improvement in the ſalubrity of the air, which cannot be imputed to the diminution of the heat, though that renders the climate more agreeable †. The ſtation of this kind, of which the troops have had moſt experience, is Stoney Hill. In 1782 and 1783, the 19th and 30th regiments enjoyed a degree of health there, little if at all inferior to what might have been expected in any part of England ‡. They ſeldom had more than 20 ſick in hoſpital, and the proportion of deaths was altogether inconſiderable.

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* Vid. Chap. ii.

Such being the healthineſs of particular ſituations in our Weſt India iſlands, it may be matter of ſurpriſe, that the mortality ſhould have been ſo great among our troops. But it is to be obſerved, that on actual ſervice many of the precautions eſſential to health cannot be attended to, ſuch as a proper choice of ground, and avoiding what is wet and marſhy; though perhaps even in this way ſomething might be done, if more were attempted. Whenever it is not inconſiſtent with the ſervice on which ſoldiers are ſent into that country, to keep them on board of tranſports, it would ſave the lives of thouſands. Some regiments ſerving on board the fleet ſuffered very little, while others on ſhore were almoſt annihilated by the diſeaſes of the country; ſo different is the air at ſea from the air at land. In times of peace the health of the men kept in the iſlands for the ſupport of civil government, and as a garriſon for defence, has certainly not been made ſo much an object of attention as it deſerved, conſidering the great importance it is of in two points of view. Firſt, that it would ſave a large ſum of money to the nation, expended annually in recruiting, diſciplining, and conveying ſoldiers to the Weſt Indies, to ſupply the room of thoſe who have died: and ſecondly, that every ſtep taken to preſerve the lives of ſoldiers, may be conſidered as the beſt means of having always in that part of the world, a body of troops ſeaſoned to the climate, and therefore of more uſe in caſe of any emergency, than double their number ſent from Europe.

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* Vid. Chap. ii.

† See note B in the Appendix.

‡ Vid. Chap. ii.

It will often happen in time of war, that more troops muſt be ſent to an iſland than there are barracks, or accommodation for; in which caſe it would be adviſeable to ſend along with them from Europe, the frames of temporary wooden barracks, which might be ſpeedily erected upon healthy ſpots. The expence of them would not be one third of what they would coſt, if they were to be conſtructed in that country, where there is often both a want of materials and artificers.

V. When the troops are properly diſpoſed of as to barracks, there ſhould be a certain number of negroes attached to each regiment; or what perhaps would be better, a company of negroes and mulattoes ſhould be formed in every regiment, to do whatever duty or hard work was to be done in the heat of the day, from which they do not ſuffer, though it would be fatal to Europeans. This regulation was adopted in part in Jamaica during the late war, and found extremely uſeful *.

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* See note C in the Appendix.

VI. The ſoldiers ſhould be ſupplied with proviſions by government; for unleſs that be done, their ſubſiſtence will be very precarious in that country, and few things are more prejudicial to health than a ſcanty and irregular diet. They ſhould be divided into meſſes, which ſhould be inſpected by an officer daily; and they ſhould not be allowed to diſpoſe of, or exchange their proviſions on any pretence, for this leads to bartering them for rum, the moſt pernicious of all things.

VII. The men ſhould be frequently out at exerciſe; and if it be in the morning, and not continued long, it will contribute to their health. The evenings are alſo cool, but there is an objection to exerciſing the men at that time, which I learned from an officer of much experience in that country. Motion even the moſt moderate is attended with profuſe perſpiration, in which ſituation the men expoſing themſelves to the cool air of the night, with wet ſhirts upon their backs, become liable to colds, rheumatiſms, and other complaints. But after the morning exerciſe the heat of the day follows, and prevents any evils of that kind. It is true, ſuch might be avoided, were the men to put on dry ſhirts after the evening exerciſe; but this is ſeldom in the power of private ſoldiers, nor would it be an eaſy matter to make them take ſo much care of themſelves, if it were.

CHAP. II.

Of the Number of Men loſt annually by the ſeveral Regiments in Jamaica; and of the various Degrees of Healthineſs of the different Quarters.

A SHORT review of the loſſes ſuſtained by the regiments in Jamaica, and of the various degrees of health which they enjoyed in the different quarters, will furniſh materials from which many uſeful concluſions may be deduced. It will point out the principal and aggravating cauſes of mortality, and what is of more conſequence, it will ſhew how in a great degree they may be avoided. It will beſides furniſh to a commanding officer, the means of aſcertaining what proportion of men will be fit for ſervice at the moſt healthy, and the moſt unhealthy, ſeaſons of the year; and alſo what diminution in their number may be expected, after a certain time.

The greateſt part of the troops were quartered at the following places; the three towns, Kingſton, Spaniſh Town, and Port Royal; the forts, Fort-Auguſta, Rock-fort, Caſtile-fort, and the barracks at the battery called the Twelve Apoſtles. There were beſides barracks at Up-park, and Stoney-hill. All the above-mentioned places, except Spaniſh Town and Stoney-hill, are ſituated either upon, or at a ſmall diſtance from, the banks of the great baſon of water that forms the harbour of Kingſton, and which with an inlet of little more than a mile, is above ten miles long, and in ſome parts four or five miles broad. Spaniſh Town is ſix or ſeven miles farther inland, and is ſituated in the flat and low part of the country, but without any marſhes in the neighbourhood. Stoney-hill is in the mountains, about ten miles diſtant from Kingſton, the three laſt of which are a ſteep aſcent, though the road be not impaſſable for carriages. There are alſo barracks in the ſeveral pariſhes, but I am not in poſſeſſion of facts to aſcertain accurately, any thing reſpecting their different degrees of healthfulneſs; though it has always been found that a

regiment,

regiment, ſent in ſmall detachments to the parochial barracks, ſuffers greatly.

The following obſervations are confined to a ſhort ſpace of time, from the year 1779 to 1783, when the regiments were reduced to the peace eſtabliſhment. I am not in poſſeſſion of materials to begin the enquiry earlier than the year 1779, which is a year and an half previous to my arrival in the iſland.

LX REGIMENT, 1ſt Battalion.

Taking the regiments in the order in which they arrived in the iſland, the 1ſt battalion of the 60th regiment comes firſt to be conſidered. It was 387 men ſtrong the 1ſt of February 1780; and in the courſe of the year 243 were enliſted. The proportion of deaths upon thoſe two numbers added together, rather exceeded 3-11ths of the whole; and of diſcharged men the proportion was rather more than 1-9th. The loſs to the ſervice in both was nearly 2-5ths of the whole, in the courſe of one year. The regiment was quartered at Spaniſh Town, had been already ſome time in the iſland, and might be conſidered as ſeaſoned. The great mortality proceeded from a detachment of nearly 200 men, who were ſent upon the expedition againſt Fort St. Juan, of whom few or none ever returned.

The ſecond year, the deaths were rather more than 1-6th, and the diſcharged did not quite amount to that number: the loſs to the ſervice in both was about 1-3d; and was in part ſtill to be aſcribed to the detachment ſent on the expedition againſt Fort St. Juan. In the courſe of the year, the proportion of ſick varied from 1-6th to 1-13th of the whole nearly. They were never more than the firſt-mentioned number, nor leſs than the laſt. Under the denomination of ſick are included not merely thoſe in the hoſpital, but alſo convaleſcents, and all ſuch who from ailments of any kind are unable to do duty.

The third year, the deaths were about 1-8th, the diſcharged nearly 1-4th; and the loſs in both about 3-8ths. It was ſix months from the concluſion of the third year, to the time of the regiment being reduced to the peace eſtabliſhment, and taking the proportion upon thoſe ſix months, and the preceding ſix months, which make the laſt year, they are nearly the ſame; that is, the deaths are between 1-8th and 1-9th, and the diſcharged are above 1-4th. The great number of diſcharged men was owing to the recruits being bad that were ſent from England, which muſt unavoidably be the caſe towards the end of a war; and was alſo preparatory to a reduction of the regiment to the peace eſtabliſhment. The ſick varied from 1-5th to 1-18th during the third year; and from 1-5th to 1-24th during the laſt year.

From the laſt returns it would appear, that Spaniſh Town may be conſidered as not an unhealthy quarter for ſoldiers. The deaths are in the proportion of one to eight, and it is computed that one in ten of the inhabitants dies annually. The difference of mortality in the firſt and laſt years, is in part to be imputed to the hoſpitals being better ſupplied with proper diet for the ſick, and the medical attendance being more regular and frequent.

The loſs to the ſervice, the firſt year that a regiment is in the iſland, is almoſt all by deaths. The ſecond year the deaths are conſiderably diminiſhed, but the number of thoſe who are enfeebled, or worn out by diſeaſe is increaſed, and therefore the diſcharged men form a large part of thoſe who are loſt to the ſervice.

The ſickly months are always determined by the fall of the rains. The mortality is not greateſt at the moſt ſickly time of the year, but about one or two months after, when the men, worn out by repeated attacks of fever and dyſentery, ſink under thoſe diſeaſes. Hence the greateſt number of deaths are in October and November, though the ſick are generally moſt numerous in Auguſt and September.

LXXIX REGIMENT.

The 79th regiment arrived in Jamaica in July 1779, 1,008 men ſtrong. They were quartered in Kingſton. The firſt year they loſt nearly 2-7ths by death. The ſecond year they loſt 4-7ths by death, but 300 of thoſe were men ſent upon the expedition againſt Fort St. Juan; ſetting aſide therefore that number, and taking the proportion upon the remainder, the deaths were nearly 5-18ths, which is not much leſs than that of the preceding year. The diſcharged men the ſecond year were 1-6th; and the loſs to the ſervice, including both dead and diſcharged, 4-9ths nearly. This great mortality was, among other cauſes, to be imputed to an unhealthy quarter. The proportion of ſick, during the ſecond year, varied from 1-half nearly to 1-5th of the whole.

The third year the regiment was very weak. There died 1-11th; there were diſcharged 1-8th; and the loſs in both was nearly 3-14ths. The ſick varied from 2-7ths to 1-6th.

The fourth year, the regiment was reinforced by men drafted from the regiments, that were ſent home. They loſt 1-4th by death, and 1-6th were diſcharged: in both the loſs amounted to 5-12ths. The ſick varied from 1-half to 1-5th. So great a difference in the mortality of this and the preceding year, while the obvious difference in the ſtate of the regiment in the two years was, that in the firſt they were weak, and in the ſecond ſtrong, leads to a ſuſpicion that the accommodation, number of officers, and other circumſtances, were equal to the care of 350, but not of 700 men.

In four years there died 910 men, including thoſe that were loſt upon the expedition againſt Fort St. Juan; there were diſcharged in the ſame time above 200; and the loſs in both exceeded their original number by 100.

LXXXVIII REGIMENT.

The 88th regiment arrived in Jamaica, in March 1780, complete from England. In the firſt year there died about 1-3d. In the ſecond year the deaths were nearly 1-5th, and the diſcharged 1-7th; and the loſs in both about 1-3d. The ſick varied the firſt year from 1-3d to 1-5th; in the ſecond from 3-7ths to 1-6th. The regiment remained four months in the iſland after the concluſion of the ſecond year, till they were drafted, and in that time loſt by death 1-11th, and by diſcharged men 1-12th.

During two years and four months there died about 7-16ths; and including diſcharged men the loſs to the ſervice was 550 out of 791, which laſt number comprehends the original ſtrength of the regiment, and alſo the enliſted men.

The great mortality in the regiment during the firſt year, was owing to their being quartered at Rock and Caſtile forts, two moſt unhealthy ſtations. After remaining there ſome time they were removed to Fort Auguſta, but a detachment was left at their old quarters, which added greatly to the ſick liſt, and to the mortality. It is alſo to be obſerved, that this was a new-raiſed regiment. The loſs the firſt year was nearly all by death; the ſecond year half the loſs was in diſcharged men.

Taking the proportions for the laſt twelve months, during which the principal part of the regiment was at Kingſton, and a detachment at Port Royal part of the time, there died 1-5th, there were diſcharged 1-7th, and the loſs to the ſervice was about 1-3d. From a compariſon of the returns of the 60th regiment, and thoſe of the two laſt regiments, Kingſton appears to be a much leſs healthy quarter than Spaniſh Town.

The 85th, 92d, 93d, and 94th regiments were embarked at Plymouth nearly at the ſame time, and they all arrived in Jamaica about the end of July or beginning of Auguſt 1780. They were new-raiſed regiments, and from the time of their embarkation to their being landed in Jamaica, there had elapſed about ſix months. They arrived at the moſt unhealthy time of the year, and there were no quarters for their reception, nor ſuitable hoſpitals for the ſick. The mortality, from all theſe circumſtances combining with the climate, was unuſually great.

LXXXV REGIMENT.

The 85th regiment were encamped in part, and quartered in part at Rock-Fort, for a ſhort time; they were afterwards placed in barracks built at Up-Park. It ſhould be obſerved, that the regiment loſt few men while on board the tranſports, owing to the great attention that was paid to cleanlineſs; yet they arrived ſickly, and many were ſcorbutic from being ſo long at ſea. There died in the firſt year 5-12ths; and the loſs to the ſervice, including the diſcharged men, was altogether nearly 1-half. The ſick varied from 1-half to 2-9ths of the whole.

In the ſecond year, or rather the next eleven months, for before the year was completed the regiment was drafted, the proportion

portion of deaths was rather more than 1-8th, and of diſcharged men 1-14th: the loſs in both was nearly 1-5th. The ſick varied from 1-3d to 1-8th.

The difference between this and the preceding year, is to be imputed to the regiment being ſeaſoned, to their being lodged in good barracks, and to proper proviſion being made for taking care of the ſick.

It may be laid down as a maxim, that no troops can ſtand encampment, even for a few weeks, in the low and flat parts of the Weſt India Iſlands.

The quarters at Up-Park are ſcarcely more healthy than thoſe at Kingſton.

One cauſe of ſickneſs in this regiment deſerves to be taken notice of, as the other regiments were alſo expoſed to it in their turn, that is, the duty of the priſon guard. There were a great many priſoners brought to Jamaica at different times by the ſhips of war, and the place in which they were confined neceſſarily required a guard. The priſon was at the diſtance of two miles from the quarters of the 85th regiment, and was low as to ſituation, being cloſe upon the ſhore. It was found that a large proportion of the ſoldiers, ſent on this duty, were ſeized with fevers.

XCII REGIMENT.

The 92d regiment were quartered at Spaniſh Town; they were ill ſupplied with every neceſſary for their hoſpital, and they were much confined in their quarters. In the firſt year there died nearly 5-12ths; there were diſcharged 1-25th; and the loſs in both was about 11-25ths. The ſick varied from 1-half, or rather more, to 1-28th.

The ſecond year, or more properly the next eleven months, the deaths were not quite 1-12th; and the diſcharged men were 1-14th: the loſs in both was between 1-6th and 1-7th. The ſick varied from 1-12th to 1-38th. This is a ſuperior degree of health to that enjoyed by the 85th regiment at Up-Park; and though there may have been other circumſtances that contributed to it, yet it no doubt depended principally on the quarters at Spaniſh Town being more healthy than thoſe at Up-Park, as farther appeared, by the number of ſick admitted into the hoſpitals being much greater in the latter, than in the former place.

When the 85th and 92d regiments were drafted, in the former there were 219 men fit for ſervice; in the latter there were 277. The 85th regiment had enliſted 148, the 92d regiment 41; and they both arrived in the iſland nearly 600 men ſtrong. Of the 85th regiment there remained of the original number 71, at the end of one year and eleven months from their arrival in the iſland; of the 92d regiment there remained 236. It is to be obſerved, that the laſt-mentioned regiment were ſickly when they arrived in Jamaica, owing to their having been ſo long on board the tranſports; but they loſt few or none on the paſſage, from the attention that was paid to keep the men, and ſhips clean.

XCIII REGIMENT.

The 93d regiment were quartered at Kingſton. They were ſickly on board the tranſports, and many died on the paſſage. They landed with a great number of ſick, and in all they amounted to 404 men. In the ſpace of ſix months upwards of 1-half died; and of the remainder only 71 were fit for ſervice, who were drafted into another regiment. At the end of ſix months the loſs to the ſervice, in dead and diſcharged, amounted to 9-11ths of the original number.

The cauſes of a mortality ſo dreadful, are to be found in their being new-raiſed and undiſciplined men; being ſickly and ſcorbutic from long confinement on board of tranſports; arriving in the iſland at the moſt unhealthy time of the year; being placed in bad quarters; and in their having no adequate proviſion made for their great number of ſick.

XCIV REGIMENT.

The 94th regiment were very ſickly on board the tranſports, and loſt ſome men on the paſſage. They landed 531 men, and were immediately ſent in ſmall detachments to the different country quarters. By the end of the firſt year there were upwards of 1-half dead. In the ſecond year there died 2-7ths of the remainder. At the end of two years and four months, there remained of the whole number 1-7th fit for ſervice, who were drafted into another regiment. Thus, the loſs to the ſervice was 6-7ths of the whole in two years and four months.

In the above four regiments there died, in the firſt ſix months, rather more than 2-5ths of the numbers landed.

It is with horror, that we thus ſee our fellow-creatures ſacrificed in thouſands to the dreadful viciſſitudes of climate, joined with other cauſes of mortality: and if ſuch be the caſe in our own iſlands, where there are no enemies to encounter, and where the evils of the climate are not aggravated by the fatigues and hardſhips unavoidably attending actual ſervice, ſome idea may be formed of the dreadful havock, that muſt enſue among European troops, when thoſe cauſes are combined.

The firſt expedition of any note, ſent from this country to the Weſt Indies, was that againſt Hiſpaniola under Cromwell. They failed in their attempt upon that iſland, but afterwards attacked Jamaica, where they met with little reſiſtance. There were above 10,000 land forces ſent upon the expedition, yet we find them calling for reinforcements, almoſt as ſoon as they were in poſſeſſion of the iſland; and in a ſhort time after, repreſenting the diſadvantages ariſing from ſending new-raiſed men*.

In the unſucceſsful expedition againſt Carthagena, of the troops landed, and who remained on ſhore only ten days, the loſs in that time was one fourth of the whole nearly, of whom by much the greater part fell a ſacrifice to the climate. When they were embarked, the number of ſick, compared with thoſe that were well, was in the proportion of 2 to 5.

The dreadful mortalities attending the ſucceſsful expeditions againſt Martinique, Guadaloupe, and the Havannah, are ſtill freſh in the memories of many. It is ſufficient to ſay, that a very ſmall part of the victorious troops were alive, three months after their conqueſts.

In the late war, 5,000 of the braveſt troops in the world took poſſeſſion of the iſland of St. Lucia: their loſs in killed and wounded, in the ſeveral unequal and deſperate attacks that were made upon them by the enemy, was not conſiderable; but at the end of a twelvemonth, ſcarcely a man remained of the original number. The mortality continued as great in the ſubſequent years. From the 1ſt of May 1780 to the 1ſt of May 1781, the number of dead was equal to the average ſtrength of the garriſon during the year. Of the troops ſent upon the expedition againſt Fort St. Juan from Jamaica, ſcarcely a man ever returned.

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* Letters in the public offices, Jamaica.

The mind recoils with horror, from ſuch ſcenes of deſtruction of the human ſpecies; in reſuming however more immediately the ſubject of the health of the regiments in Jamaica, there is this conſolation, that no examples of mortality occur equal to thoſe already mentioned; and that the facts to be ſtated point out the means, by which a remedy may be provided againſt ſo great an evil.

DUKE OF CUMBERLAND'S REGIMENT.

The Duke of Cumberland's regiment, a provincial corps raiſed in America, and conſiſting of native Americans from the ſouthern provinces, arrived in Jamaica in 1781. They were quartered in Fort-Auguſta, and remained there nine months; in which time the deaths were 1-52th. Only one man was diſcharged, and the ſick varied from 1-12th to 1-30th. Soldiers cannot be expected to enjoy better health in any country; and it was ſuſpected, that having been uſed to heats not inferior to thoſe of tropical climates, they were leſs liable to the diſeaſes of the Weſt Indies. But there was no good ground for this ſuppoſition, as appeared on the regiment being moved from Fort-Auguſta, which happened in the end of April. They went to Stoney-hill, and remained there four months, in which time ſix men died, and four were diſcharged. The proportions taken for the thirteen months were in deaths 2-67ths; in diſcharged 1-108th; and the loſs in both 1-26th, which for the year is not a loſs of more than 1-28th.

The next year they were quartered at Kingſton; there died rather more than 2-13ths; there were diſcharged 1-60th; and the loſs in both was 4-23ths, that is, more than 1-6th. The ſick varied from 1-7th to nearly 1-half of the whole. The mortality, though great, is ſtill leſs than what other regiments ſuffered in the ſame quarters, which is to be imputed to two cauſes; firſt, that the men were in part ſeaſoned to the climate; and ſecondly, that the Americans were more orderly, and leſs guilty of exceſs in drinking, than the Britiſh ſoldiers. The greateſt mortality happened in the months of November and December, though the ſick were more numerous in the preceding months.

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XIV REGIMENT.

The 14th regiment arrived in Jamaica in April 1782. Five companies were quartered at Spaniſh Town, and five at Fort Auguſta; and theſe laſt, after three months, were moved to Spaniſh Town, where the whole regiment remained. In the firſt year there died 1-6th nearly, and 1-10th were diſcharged *; the loſs to the ſervice in both was 4-15ths, or more than a quarter. This regiment enjoyed moſt of the advantages that troops can have, that are ſent to Jamaica.

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* This number of diſcharged men is greater than common for the firſt year, which is to be imputed to the regiment having been in Hilſey barracks previous to their embarkation, whereby many of the men had their health greatly injured, by the fevers produced by that unhealthy quarter. See note C, in the Appendix.

It was an old regiment, in good order, and they arrived at an healthy time of the year. The quarters they were put into at Spaniſh Town, may be conſidered as a mean between the moſt, and the leaſt, healthy. The ſick were well provided with hoſpitals, proviſions, and attendance; and their numbers varied from 1-7th to 2-7ths of the whole. Notwithſtanding all theſe advantages the mortality is great, yet inconſiderable when compared with the numbers loſt by the 92d regiment in the ſame quarters, during their firſt year. The deaths of the one were 5-12ths, and of the other only 1-6th. There is a circumſtance that ſhould be taken notice of here, as it ſets in a proper light the degree of healthineſs of the quarters at Spaniſh Town: a large proportion of the ſick and of the deaths, both in the 14th regiment, and in the 1ſt battalion of the 60th regiment, during the laſt year, was owing to an out-poſt, eight or nine miles diſtant from Spaniſh Town, to which the two regiments ſent detachments. The detachments were ſmall, but in general almoſt all the men ſent upon that duty were brought to the hoſpital, and many of them with fevers of the worſt kind.

In the ſame quarters, the 14th regiment loſt by deaths 1-6th, and the 69th regiment 1-8th; which difference is to be imputed to the latter being ſeaſoned. It is to be taken into the account, that the 60th regiment had a conſiderable number of recruits ſent from England, which increaſed the mortality. The 92d regiment, in the ſame quarters, during the ſecond year loſt nearly 1-11th: it may not therefore be unfair to conclude, that in ſimilar circumſtances, the mortality will be nearly twice as great the firſt year as the ſecond.

XIX and XXX REGIMENTS.

Seven companies of the 19th and 30th regiments arrived in Jamaica in July 1782; and were quartered at Stoney Hill. In the ſix following months, which include the ſickly ſeaſon, they loſt by deaths 1-26th.

The remainder of the 19th regiment arrived in January 1783, and were placed in the ſame quarters, where they remained eight months longer, till the regiment was reduced to the peace eſtabliſhment; and in that time there died 1-27th.

The remaining companies of the 30th regiment, arrived at the ſame time with thoſe of the 19th regiment, and were quartered alſo eight months longer at Stoney-Hill, in which time there died 1-34th. The annual mean of deaths upon the whole was 1-17th nearly.

The diſcharged men in the firſt ſix months, were 1-94th from the ſeven companies; during the following eight months, they were 1-19th from the 19th regiment; and 1-32d from the 30th regiment: the annual average of diſcharged men upon theſe is 1-21th nearly. Taking therefore the loſs by death and diſcharged men together, it is ſomewhat more than 1-10th. Small as this loſs muſt appear, when compared with the mortalities before mentioned, there are ſeveral circumſtances that deſerve to be taken notice of, which give a ſtill more favourable idea of the healthineſs of this quarter. The whole number of dead in the returns, did not actually die at Stoney-Hill; ſeveral of them died before the two regiments joined thoſe companies, that firſt arrived. The number of the dead in the ſurgeon's returns on the ſpot, do not much exceed the half of thoſe in the general return, which included thoſe that died at Jamaica, as well as elſewhere. Of thoſe that died at Stoney-Hill, ſeveral were taken ill either at Kingſton, where they were upon leave, or on the road back to the barracks.

The 19th and 30th regiments were not ſeaſoned to the climate, and they arrived at a ſickly time of the year, yet their loſs was greatly leſs than that of the regiments at Spaniſh Town that were ſeaſoned, and where every poſſible care was taken both of the men that were well, and of the ſick. Such are the ſuperior advantages of the quarters at Stoney-Hill. The ſick varied from 1-6th to 1-10th, but moſt of them were trifling ſores that were not taken into the hoſpital. The ſick in hoſpital varied from 1-22th to 1-36th only.

XCIX REGIMENT.

The 99th regiment was very unfortunate, being nearly all captured on their paſſage to Jamaica. About three companies arrived in 1781, which were ſent into country quarters, and the regiment did not aſſume any form till July 1782, when they were collected all together at Fort Auguſta. They remained there ſeveral months, and ſent detachments to Port-Royal, and the Twelve Apoſtles; a conſiderable number were alſo embarked on board the men of war, to ſerve as marines; and they were afterwards quartered on the *Palliſades*, where temporary barracks were erected. The name of *Palliſades* is given to a long ſand-bank, which ſeparates the harbour of Kingſton from the ſea. The ſituation is of the ſame kind as that of Fort-Auguſta. In the year they loſt by deaths 1-11th; by diſcharged men 2-11ths; and by both 3-11ths. This loſs may be conſidered as great, as they were in healthy quarters; but the men collected from the parochial barracks were ſickly and worn out, and increaſed both the number of dead and diſcharged, but particularly the laſt; add to this, the recruits that compoſed one half of the regiment were not good men, as muſt be the caſe towards the end of a war.

III, LXIII, LXIV, and LXXI REGIMENTS.

Theſe regiments, or rather the remains of them, arrived from Charleſtown, South Carolina, in January 1783: they amounted in all to about 800 men.

The 3d and 63d regiments were quartered at Fort Auguſta. In eight months there died of the 3d 1-23th. They arrived ſickly, and many of the men were worn out by the fevers, under which they had laboured in South Carolina. The ſick varied from 1-5th to 1-29th; they arrived with the former number, and when they left the fort they had nearly the ſame proportion, in conſequence of the ſea riſing to an unuſual height, overflowing the fort, and leaving ſtagnant water to putrefy, which produced many fevers both in this regiment, and in the 63d.

The 63d regiment arrived ſickly; they had 2-7th on the ſick liſt. The deaths in eight months were 1-10th nearly. The ſick after a ſhort time fell to 1-13th, and did not exceed that number, till raiſed by the inundation above mentioned.

The 64th regiment was quartered at Port-Royal, and in eight months time loſt by deaths 1-123th. The ſick varied from 1-8th to 1-16th. Port-Royal ſtands upon a bank of ſand, in the ſame way that Fort-Auguſta does, and is a healthy quarter; it would be more ſo, if the town were kept cleaner, and if there were fewer ſhops in it, that retailed ſpirituous liquors.

The 71ſt regiment was quartered at the Twelve Apoſtles, which is ſituated upon a rock, and is alſo an healthy quarter. In eight months the deaths were 1-65th; and the ſick varied from 2-9ths to 1-7th.

AN average of the number of ſick during three years and an half, in which are included the convaleſcents, gives 1-3d of the army unfit for ſervice, at the time of the greateſt ſickneſs, and 1-8th, at the time of the leaſt ſickneſs. The average of deaths annually upon the whole, is nearly one in four, and of diſcharged men about one in eight, which together make the loſs 3-8ths of the whole.

In leſs than four years, there died in the iſland of Jamaica 3,500 men; thoſe that were diſcharged amounted to one half of that number, which make in all 5,250 men, loſt to the ſervice in that ſhort period of time, from the climate and other cauſes of mortality, without a man dying by the hands of the enemy.

The miſchievous effects of ſending new-raiſed men to the Weſt Indies, are exemplified in the ſtrongeſt manner, in all the young regiments. The mortality has likewiſe been greatly increaſed on many occaſions, by the troops leaving England at an improper ſeaſon, and arriving in the Weſt Indies at the ſickly time of the year. But what has the greateſt influence, of all the circumſtances that affect the health of ſoldiers in thoſe climates, is the kind of quarters in which they are placed. Kingſton and Up-Park are both bad quarters; and Rock-Fort, from the ſwampy ground in its neighbourhood, and on which it ſtands, is ſtill worſe. Spaniſh Town is better than Kingſton, though greatly inferior to Fort-Auguſta or Stoney-Hill; indeed theſe two laſt quarters would not be reckoned unhealthy, in any part of the world. Similar ſituations are to be found in all parts of Jamaica, and, I doubt not, in moſt, if not all, of the other Weſt India iſlands. The ſituations are of two kinds; dry ſand-banks, ſurrounded either wholly, or in part, by the ſea, and out of the reach of noxious winds blowing from ſwamps and marſhes; and elevated ſtations in the mountains. In places ſo circumſtanced, the effects of the remittent fever are ſcarcely felt.

If we may be allowed to make the ſuppoſition, that quarters had been provided for the troops in ſuch ſituations, of 5,250 men loſt to the ſervice, there would have remained, at the end of three years and an half, 3,500 fit for duty, ſuppoſing them to have been placed at Stoney-Hill, and to have ſuffered the greateſt loſſes that have happened in that quarter.

No attendance or care of the ſick can counterbalance the ill effects, ariſing from the quarters in which the troops have hitherto been placed. By profeſſional ſkill, and diligence, the life of the individual may often indeed be preſerved, but the *ſoldier* is loſt to his country: and the national purpoſes, for which he is conveyed into thoſe diſtant provinces, are as effectually fruſtrated by the ruin of his health, as they would be by his death. Our humanity alone is not intereſted in the preſent caſe, though ſurely the object well deſerves that it ſhould; but the ſafety of the Weſt Indies, and the ſaving of enormous ſums to government. If the troops, ſent for the defence of our iſlands, die as we have ſeen them, the mother country cannot long ſupply, during a war, ſuch an inceſſant drain: beſides, the mortality is ſometimes ſo great and ſpeedy, that a ſufficient interval is not left to make known the want of men, and receive ſupplies in proper time. In April 1782, when Jamaica was expected to be attacked, though upwards of 7,000 men had been ſent there in the three preceding years, there were not above 2,000 men fit for duty.

It may be permitted to point out another advantage, and not an inconſiderable one, that would reſult from placing the troops in the healthy quarters mentioned above. The nation would at all times have a body of ſeaſoned men in the Weſt Indies, which in military operations either offenſive or defenſive, in that quarter of the world, would be of more value than twice the number of the beſt troops, that could be ſent from Europe. Such an object muſt be of conſequence, as the Weſt Indies have been a principal ſcene of action in the two laſt wars, and are likely to become ſo again in any ſubſequent war.

To conclude, the intereſt of government, the ſafety of our Weſt India poſſeſſions, and the calls of humanity, are all equally concerned, in providing quarters for the troops in healthy ſituations. That ſuch are to be found in the iſland of Jamaica, is proved by full and repeated experience; and there is this farther to be ſaid in their recommendation, that they are in general favourably circumſtanced for the defence of the country. Stoney Hill, of which mention has ſo often been made, was deemed by Sir John Dalling, and Sir Archibald Campbell, both officers highly diſtinguiſhed for their military knowledge, a moſt advantageous poſt for the defence of the iſland*.

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* See note D in the Appendix.

CHAP. III.

Of FEVERS.

THE fevers, that prevail in Jamaica, are either of the intermittent, or remittent kind. Of the former there are tertians, quartans, and quotidians, in all the various forms they occaſionally aſſume. The remittent fevers are both the moſt frequent, and moſt fatal. There appears to be an intimate connection between them; the intermittent often running into the remittent; and the remittent ſometimes terminating in an intermittent. It would ſeem that they proceeded from the ſame cauſe, acting with greater or leſs force at different times; for, in the more healthy ſeaſon of the year, the fevers are chiefly intermittent, and in the moſt unhealthy, remittent.

SECT. I. *Of the Symptoms of the Remittent Fever.*

PERSONS at all times of life, from infancy to old age, are ſubject to the remittent fever. It attacks, however, men oftener than women; young children, till they reach their third or fourth year, are not ſo liable to it as afterwards; and old people are likewiſe leſs ſubject to it. This, probably, is not owing ſo much to there being any thing either in age or ſex that reſiſts the fever, as to perſons of the above deſcription being leſs expoſed to the cauſes of it. It is both moſt violent and moſt fatal, in thoſe who are lately arrived in the iſland, and they are at their firſt coming more ſubject to it than afterwards.

The uſual manner in which it ſhews itſelf is as follows. There is uneaſineſs with languor, followed by a ſenſe of chillineſs or cold ſhiverings, which are ſoon ſucceeded by great heat, particularly in the palms of the hands and forehead; head-ach, great loſs of ſtrength, ſickneſs at ſtomach, and frequently violent vomiting. Phlegm, or what was eaten at the laſt meal unchanged, is firſt brought up, and afterwards bile, yellow, or greeniſh. The pulſe is quick, and at firſt ſmall; it ſoon becomes full but is ſeldom hard. There is not unfrequently much pain in the ſmall of the back, or a ſenſe of ſoreneſs in ſome of the limbs, which is ſometimes diffuſed all over the body, as if it had been beaten and bruiſed. Reſtleſſneſs, great anxiety, oppreſſion at the breaſt, and frequent ſighings, are common ſymptoms, and ſometimes riſe to ſuch an height, that the ſick appear to labour greatly in their breathing. There is not however any difficulty in diſtinguiſhing thoſe ſymptoms, from laborious reſpiration depending upon a local affection of the lungs. In the latter the difficulty of breathing is uniform; whereas in the former, both the expirations and inſpirations will for two or three times together be natural and eaſy, and immediately after become laborious and unequal, and ſo on alternately. The vomiting is ſometimes conſtant and violent, eſpecially in the worſt kind of the diſeaſe; and the blood being frequently in a diſſolved ſtate, is forced into the ſtomach, and thrown up, forming what has been called by the Spaniards the *black vomit*. The blood is ſaid ſometimes to tinge the urine and ſaliva, and even to iſſue from the pores of the ſkin; none of which appearances I have ever ſeen; though in the moſt unhealthy parts of tropical climates, when diſeaſes are aggravated by the fatigue and hardſhips attending troops on actual ſervice, they are reported to occur, and not unfrequently. As the heat increaſes the face gets fluſhed, the ſenſes are more affected, and the patient often becomes either wild and delirious, or drowſy and lethargic. Theſe ſymptoms, after a time, are ſucceeded by a ſweat, which is often profuſe, and gradually procures an abatement of the fever.

The length of the fit varies conſiderably. It ſometimes terminates in ſix or ſeven hours, though its duration is more commonly from fifteen to twenty-four hours. In ſome inſtances it extends even to thirty-ſix and forty-eight hours; and I ſaw one example of it continuing three complete days, without any marks of remiſſion. The ſeveral ſtages of the fit, known under the names of, the cold, the hot, and the ſweating, vary likewiſe conſiderably in their duration. The cold ſtage is generally very ſlight, and often there is none at all, which I believe in ſome meaſure is owing to the heat of the climate; for, I obſerved that the rigors and ſhiverings were more conſiderable in the cold, than in the hot months. I have, however, in a few inſtances, ſeen the cold fit laſt above half an hour, with ſevere rigors all over the body. The hot ſtage conſtitutes by much the longeſt part of the paroxyſm, and is generally terminated by a ſweat. This is not however always the caſe, for the fever ſometimes remits gradually, without any ſenſible increaſe in the perſpiration: nor is every ſweat that occurs during the hot fit, even though profuſe, critical as to a remiſſion; for, a great perſpiration will ſometimes continue one or more hours, and go off without at all relieving the ſymptoms.

The tongue is at firſt white, and if the fever be violent, and conſiſt of two or three fits, it grows brown and dry, and even becomes chopt. The thirſt is commonly great, though in ſome caſes it is not increaſed. The urine is little changed by the fever, being always high-coloured in warm climates. With the fluſhing of the face, the eye often becomes muddy, and even red, as if inflamed; and this appearance keeps pace with the progreſs of the paroxyſm, the redneſs being greateſt when the fever is higheſt, and gradually decreaſing as the remiſſion takes place.

Hitherto the difference between the fever of this iſland, and thoſe occurring in other countries, is not very conſiderable; but the ſudden aggravation of the ſymptoms, as appears in an immediate and almoſt total loſs of ſtrength, a great degree of ſtupor, and even total inſenſibility, followed by convulſive ſtartings of the tendons and death, marks an extreme degree of violence, ſuch as is rarely obſerved in the fevers of other countries at ſo early a period; for, all thoſe ſymptoms will ſometimes happen during the firſt paroxyſm, and even in the ſpace of twelve hours. One of the worſt ſymptoms, which frequently occurs, is inceſſant retching or vomiting, with great pain at the pit of the ſtomach. It not only harraſſes and weakens the patient, but by rendering it impoſſible to make uſe of any medicine, either for the immediate relief of the fever, or to prevent a ſubſequent paroxyſm, is attended with the moſt imminent danger.

The remiſſions vary much in their duration; ſome do not laſt longer than one or two hours, though more commonly they continue ten or fifteen, and ſometimes thirty, and even thirty-ſix hours. The fever in ſome caſes aſſumes the quotidian type, and has an exacerbation every day at nearly the ſame hour; but generally it obſerves no regularity in the times, either of acceſs, or remiſſion. The remiſſions are more or leſs complete; ſometimes they amount almoſt to an intermiſſion, though much more generally there is only an abatement of the ſymptoms. The pulſe becomes ſlower, the ſkin cooler, and the head-ach, reſtleſſneſs, and ſickneſs diminiſh, or go entirely off. Yet it ſometimes happens that the remiſſion is not ſo ſtrongly marked, and is only to be diſtinguiſhed by an abatement of the head-ach and reſtleſſneſs, with ſome diminution of the quickneſs of the pulſe, and of the heat of the ſkin. In judging of the heat of the ſkin, the feel of the ſick perſon's hand is not to be truſted to; for, the perſpiration riſing freely in vapour from every pore, gives a coolneſs to the hand, which would lead to an erroneous opinion. The feel of the cheek, and particularly the forehead, is what beſt marks the degree of febrile heat.

The ſleep, during the remiſſion, is diſturbed, and procures but little refreſhment.

The ſecond fit is always more ſevere than the firſt, if nothing has been done to check the progreſs of the fever. It is commonly without any cold ſtage, or even ſenſe of chillineſs. All the ſymptoms run higher; the ſkin is hotter, the pulſe quicker, the head-ach greater, the ſenſes more confuſed, the thirſt often intenſe, and a *delirium* or *coma* come on more quickly and with greater violence, and ſometimes terminate in convulſions and death.

As the delirium approaches, the eyes look wild, the voice becomes quick, and it changes from the natural tone to a ſharper; there is alſo extreme eagerneſs in every motion, with an inceſſant tumbling, and change of poſture. Wild imaginations of impending danger, of dreaded evils, or of important buſineſs calling for immediate execution, ſeize the unhappy ſufferers, and impel them to efforts and exertions equally violent and ſudden. Reſtraint, though neceſſary, renders them outrageous, they tremble all over, and are ſhook with frequent momentary convulſions. From this ſtate of exceſſive agitation, in which the recollection of perſons and of things is equally confounded, the ſick gradually ſink into a *ſtupor*. Articulation becomes difficult, the voice faulters, and inſtead of ſpeech there is only a muttering; they cannot be rouſed to give an anſwer, and the convulſive tremors and ſtartings ſtill continue. With all theſe ſymptoms, and with the pulſe beating upwards of one hundred and thirty times in a minute, the fever will ſometimes remit, the patient recover his ſenſes, and if advantage be taken of the remiſſion, life may often be preſerved.

The ſick ſometimes ſink into a lethargic ſtate, without any previous delirium. They are rouſed with difficulty, and can only give an anſwer to the ſimpleſt queſtions, after which they immediately fall again into a ſtate of inſenſibility. They can give no account of their feelings, or of the manner in which they were ſeized; and in general have not the ſmalleſt recollection, not even as of a dream, of any perſon or thing, that has been before them, while in that ſituation.

It is however to be obſerved, that though both delirium and coma are frequent occurrences, they are not eſſential to the fever, which often exiſts in all its violence, and proves quickly fatal, without the ſenſes being materially affected. There is indeed a way in which the fever terminates fatally, and that often without raiſing even a ſuſpicion of danger. The violence of the fit begins gradually to abate, the ſkin grows cooler, the pulſe ſlower, and the ſenſes, if diſordered, become more clear and diſtinct. Theſe are flattering ſymptoms, and in ſuch a ſituation danger is ſcarcely apprehended; yet, if the ſtrength be gone, if the countenance be languid and ſunk, if there be a total indifference to food or nouriſhment, even though not rejected, and an averſion to every exertion even the ſmalleſt either of the mind or body, and if the pulſe at the ſame time that it becomes ſlower is alſo weaker, though the patient complain of nothing, he is faſt approaching to his end, and dies in a few hours; his pulſe all the time indicating no danger, till excited by the pangs of death. When the recollection is tolerably diſtinct, which it often is, the patient is frequently the firſt to give notice of the approaching danger, from certain ſenſations of internal weakneſs which he feels. When ſuch a termination happens, it is commonly after the ſecond or third fit, particularly when the diſeaſe is very violent, and affects thoſe, who are lately arrived in the iſland,

When the fever is thus ſevere, a ſymptom often occurs, which has given a name to the diſeaſe, as if a diſtinct one; I mean a yellowneſs of the eyes and ſkin, from which it has been called the *yellow-fever*. This happens chiefly to new comers, their fevers being the worſt; but it is not confined to them, for it appears ſometimes in the natives, and in thoſe who have reſided ſeveral years in the iſland. It is produced by the addition of a jaundice to the other ſymptoms of the fever. I call it jaundice, becauſe in no reſpect did the yellowneſs appear to differ from that, which uſually accompanies that diſeaſe. It is firſt to be obſerved in the eyes, and next tinges the neck and ſhoulders, and afterwards the whole body. The urine is alſo of a very deep colour, and ſtains linen rag yellow, like to that of a perſon in the jaundice. There appeared no reaſon for ſuſpecting a diſſolution of the blood to be the cauſe of the yellowneſs, for it happened frequently when no marks of ſuch diſſolution were to be found; and when they were preſent, they were not neceſſarily accompanied with a yellowneſs of the ſkin.

They never indeed occurred to me together, from which I would not infer that they never are combined, but only that they are not connected as cauſe and effect. The fever was always violent, and generally accompanied with great pain at the pit of the ſtomach extending over the epigaſtric region, and with ſevere retchings. It was characteriſed by the uſual exacerbations and remiſſions, and had no peculiar ſymptom, except the yellowneſs, to intitle it to be conſidered as a diſtinct diſeaſe.

This change of colour in the ſkin, though moſt common in the fevers of the Weſt Indies, is not confined to them, being frequently obſerved in other warm climates. There are inſtances of jaundice accompanying the fits of intermittent fevers in England, and I have ſeen two examples of yellowneſs, or jaundice in the hoſpital or jail fever *. The yellowneſs in the yellow fever appears ſometimes towards the end of the firſt fit, though more commonly after the ſecond or third; and the unexpected and fatal termination of the fever, mentioned above, happens both

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* Haller, *Opera Minora*, vol. III. p. 374, deſcribes an epidemic fever in which the body turned yellow.

when this ſymptom is preſent, and when it is not. I will not attempt to give any explanation of it at preſent, meaning to confine myſelf to a plain narration of facts, and to reſerve for another place whatever relates to matter of opinion or conjecture.

If the patient ſhould ſurvive even a third or a fourth fit, he remains almoſt totally deprived of ſtrength, and frequently has ſtill other evils awaiting him, as an attack of dyſentery, which often proves fatal to ſuch as have been previouſly reduced by the fever. It ought indeed to be obſerved, that it is no uncommon thing for the bowels to be affected with griping or purging, accompanied with dyſenteric ſtools, during the fever. This combination of dyſentery and fever would ſeem to depend upon ſomething in the ſeaſon, for in one year it ſhall be very common, and not ſo in another. At all times, however, the fever if neglected, or ill treated, is apt to terminate in dyſentery, eſpecially in ſoldiers.

Convaleſcents are ſubject to relapſes, which happen often in this fever, and are no leſs dangerous than the firſt attack. They are moſt frequent during the ſickly ſeaſon, and are readily produced by fatigue, expoſure to the heat of the ſun, or any irregularity. Sometimes they recur at various intervals, as ſix or ſeven days, fifteen or ſixteen, or twenty-five and thirty days; and this for a long time together, but without any great exactneſs in their periods; and each return commonly conſiſts of one, two, or more fits of the fever. Under ſuch circumſtances the diſeaſe often produces dropſy, and enlargements and indurations of the liver or ſpleen, which in many inſtances terminate in death.

The violence of the ſymptoms, and degree of danger, ſuch as above deſcribed, take place chiefly, in thoſe who are but lately arrived in tropical climates, and during the moſt ſickly ſeaſon of the year. In the natives, and thoſe who have reſided ſome time in the iſland, the fever is by no means ſo formidable, being neither ſo violent in its onſet, nor ſo rapid in its progreſs. It often begins in ſlight feveriſh fits, one or two of which ſhall paſs, and the patient pay little regard to them; yet a third or fourth ſhall not be much ſhort of the violence of ſymptoms already deſcribed. It ſometimes begins as a regular intermittent, and is changed into a remittent, by the fits gradually getting longer, and running into one another.

Though the fever be more gradual in its approaches in the natives and old inhabitants, yet when it riſes to a great height, they are longer in recovering their ſtrength, and in getting the better of the other ill conſequences of the diſeaſe, than even new-comers. They are likewiſe more liable to relapſes at various intervals, as two or three weeks, or as many months; but they are not ſo violent as in new-comers. They conſiſt uſually of one or two fits of fever, accompanied with ſickneſs, retching, and frequently a copious diſcharge of bile; from whence ſuch patients are commonly ſaid to be bilious, the bile being ſuppoſed to be the cauſe of the diſeaſe. The attacks are generally preceded by loſs of appetite, indigeſtion, and flatulence in the ſtomach and bowels. In the intervals they ſometimes enjoy tolerable health, even for years together; more commonly, however, repeated attacks gradually weaken the powers of digeſtion in the ſtomach, and occaſion a remarkable loſs of fleſh and ſtrength. The complexion grows pale, ſallow, and even of a lemon-colour, and the whites of the eyes are clearer than common. In this ſituation one fit, more violent than the others, ſhall perhaps put an end at the ſame time to the patient's life and the diſeaſe. Such is the uſual manner, in which the diſeaſe proves fatal in the natives, and old inhabitants; yet both in them, and in new-comers, it often admits of a ſpeedy ſolution after two or three fits, and the patient ſoon recovers compleatly his ordinary health.

It is worth remarking, that the fever ſometimes appears in a very ſlight way, with languor, loſs of appetite, ſome degree of head-ach, diſturbed ſleep, and whiteneſs of the tongue, the patient being able all the while to go about his uſual employment. In ſymptoms ſo moderate the preſence of a fever is hardly acknowledged, through the readineſs with which they riſe into a ſevere diſeaſe, on the leaſt irregularity, or any anxiety or diſtreſs of mind, leaves no doubt of their nature.

To ſlight feveriſh ſymptoms, are ſometimes ſuperadded, ſmall painful tumours in the ſkin, called *cat-boils*. They appear to be ſmall carbuncles. There is firſt a pain felt in the ſkin, eſpecially on being touched, which is ſoon followed by a ſlight ſwelling not unlike a common pimple. They are ſometimes as large as a nutmeg, and are exceedingly painful, eſpecially if ſqueezed, or near a joint where there is much motion. They do not ſuppurate, but form a kind of core, which is diſcharged by one or more holes from the ſmall tumour. Any violence offered to them, ſuch as attempting to ſqueeze the matter out of them as in a common pimple, produces great ſwelling and pain in the ſurrounding parts. They are conſidered as favourable ſymptoms, being ſuppoſed to prevent a fever. That however did not appear to be true, for there were many inſtances of perſons being troubled with them for ſome time, and yet having a fever before they got rid of them. The fever in ſuch caſes was not of the moſt violent kind, though it is not clear that this was owing to the ſmall boils. What might with more certainty be inferred from their preſence was, there being a diſpoſition to fever in the conſtitution for the time. Like the affection of the bowels, they were in one ſeaſon more prevalent than in another.

After deſcribing the more uſual appearances of the fever, it will not be improper to give ſome account of thoſe, that were more uncommon.

In ſome caſes the fever begins with fits, like thoſe that happen to children at the eruption of the ſmall pox; and it was only in children that I ſaw this ſymptom, though I believe it is not always confined to them. It began in an officer, on the expedition to the Spaniſh main, with a fainting fit. The jail fever has likewiſe been obſerved to begin with fits in children. This ſymptom in children, has often given occaſion to ſuſpect worms for the cauſe of the diſeaſe, which has led to a dangerous treatment: for what is proper to expel worms will do no good, but on the contrary harm, in the remittent fever.

There is ſometimes a great coldneſs, with a ſenſe of ſoreneſs, in a particular part, as the thighs, during the hot fit of the fever, while every other part is parched with heat. Such diſagreeable ſenſations increaſe greatly the febrile anxiety, and reſtleſſneſs.

An excruciating pain is ſometimes fixed in one part, and follows the fever in its increaſe and abatement, and after ſome continuance the part mortifies. I have ſeen this in the *ſcrotum*, where I believe it always proves mortal; and alſo in the foot, where it was accompanied with a diſagreeable ſenſe of coldneſs, and occaſioned the loſs of a toe.

In two or three inſtances the ſick complained of a ſenſe of numbneſs, proceeding ſometimes from the head, and ſometimes from the ſtomach, which diffuſed itſelf all over the body, and occaſioned an extreme alarm while it continued.

Among the ſymptoms, which more rarely occur, may be mentioned the *tetanus*, and an effuſion of water in the ventricles of the brain. The tetanus is of two kinds, one where it is an original diſeaſe, another where it is merely a ſymptom of the fever. It is the latter only of which I am to take notice. The examples of it, which fell under my obſervation, were few; in one it came after the fever was compleatly formed, in another it appeared as ſoon as the fever. The jaw was locked, and all the joints were rigid, ſo that the patient placed on his feet was as motionleſs as a ſtatue. The contractions of the muſcles are not equal and uniform at all times, for though they are never relaxed, there are fits of greater and leſs contraction, and in the former there is much pain. The ſkin is hot, the pulſe quick, and the tongue white, when it can be ſeen; there is alſo much pain at the pit of the ſtomach, ſome degree of ſtupor, and profuſe ſweats, particularly about the face.

In one inſtance of fever, which began in the uſual manner, except that the head-ach was greater than common, and appeared to be owing to expoſure to the ſun without any covering to the head, after two or three exacerbations a ſtupor ſeized the patient; the pupil became dilated, and was almoſt inſenſible to the impreſſion of light; he rolled his head about much, and often put his hand to it, with frequent moanings. His pulſe was about 90 in a minute, and feeble. He remained ſeveral days in this ſtate before he died. The body was examined, and there was found about ſix ounces of limpid *ſerum* in the ventricles of the brain. The viſcera of the thorax, and abdomen, were in a natural ſtate.

Beſides the ſymptoms which more rarely occur during the fever, there are ſome that follow it, that deſerve to be mentioned, though they are not often to be met with. Parotids, or ſwellings and ſuppurations of the parotid glands, are ſometimes a conſequence of the fever; as are alſo abſceſſes near the anus, and in other parts of the body. A numbneſs is at times felt in the arms, for a week or two after the fever; and ſometimes flying pains all over the body, like thoſe from rheumatiſm. There are not wanting examples even of the taſte, and ſmell, being greatly impaired, and remaining ſo, for ſeveral months. In ſome caſes, after a violent attack of fever, ſo much debility both of mind and body has remained, that the ſlighteſt cauſes would excite a fit of crying, and every exertion of the mind was accompanied with diſtreſſing agitation. Thoſe ſo affected were ſaid to be *nervous*.

It is not improbable that there may be many more ſingular, and uncommon ſymptoms of the fever, than thoſe which have fallen under my obſervation; yet the ſources, from which I derived my experience, muſt be allowed to have been of the moſt ample nature, for the ſpace of two years and four months, while I remained with the army in the iſland of Jamaica, and had the care of the military hoſpitals there.

It is matter of ſome conſolation, in the hiſtory of ſo grievous a diſeaſe, to be able to ſay with certainty, that it is not infectious. In the military hoſpitals, the ſick admitted with fevers were above three quarters of the whole, and they were often much crowded together, yet there was no reaſon to believe, that a man with any other complaint, ever caught a fever in the hoſpital. There was no inſtance of the yellow fever proving more infectious, than the fever in its more ordinary form, when it was without any change in the colour of the ſkin. It will not be out of place to remark, that in all the time I was in Jamaica, I ſaw no inſtance of the common hoſpital or jail fever, although many of the military hoſpitals were very confined; and ſome of the beſt of them conſiſted of a double platform, on which the ſick were placed as cloſe together as they could lie. The two diſeaſes are eaſily diſtinguiſhed: the diſpoſition to remit, which is conſtant in the fever of Jamaica, whether with, or without the yellow colour, and which generally ſhews itſelf in 36 or 48 hours, with few exceptions, is alone ſufficient to diſcriminate it from the jail or hoſpital fever. That diſeaſe, on the contrary, when once formed, runs its courſe with great uniformity, and for many days together, there is not the ſmalleſt appearance of exacerbation, or remiſſion. The reaſon why the jail fever was not generated in any of the hoſpitals in Jamaica, was very evident: the houſes in the country are all conſtructed ſo, as to give free admiſſion to the air, which the great heat of the climate renders neceſſary. In conſequence of this a conſtant perflation is kept up, and the air that is breathed by the ſick changes every moment, and therefore never acquires, by ſtagnation and confinement, thoſe noxious qualities, which prove the cauſe of the hoſpital fever.

As this ſubject comes to be more inveſtigated, I doubt not but it will be found, that as an hot climate, by rendering ventilation pleaſant and agreeable, prevents the jail or hoſpital fever; ſo a cold climate, by making it neceſſary to warm the air artificially, which requires it to be confined to a certain degree, gives riſe to the jail or hoſpital fever; which is not known to proceed from any other cauſe, except the human ſpecies breathing the ſame confined air for ſome time*, or from ſuch articles of cloathing as retain the poiſon thus generated. There is no reaſon to believe, that the generation of the poiſon is either forwarded, or retarded by the heat or cold of different climates, any farther than as they may prove a cauſe of the confinement, or ventilation of the air, in the apartments of the ſick, or of others that happen to be much crouded together.

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* Vid. Med. Tranſ. Vol. III. p. 345.

SECT. II. *Of the Cure of the Remittent Fever.*

IN treating of the cure of the remittent fever, I ſhall give an account of the remedies, in the order in which they were adminiſtered, when the fever had its moſt uſual appearance; I ſhall enumerate afterwards, the means that were found moſt ſucceſsful in removing, or palliating particular ſymptoms; and add a few obſervations on ſome of the remedies, that have been either ſtrongly recommended, or are in general uſe.

No diſeaſe requires more ſpeedy aſſiſtance, for the efficacy of the medicines employed, depends in a great meaſure on their being given early. The diſeaſe gains ſtrength by repeated attacks, and when allowed to have its courſe, is often fatal. It always greatly impairs the ſtrength, and frequently injures materially the conſtitution. There is no regular progreſs in the fever, by going through which, the ſick are to be reſtored to health, and to wait for any *criſis* would be time irrecoverably loſt *.

If I ſee a patient during the firſt fit, I direct an ounce of Glauber's ſalt †, or the ſame quantity of the bitter purging ſalt ‡, to be diſſolved in half a pint of water, to which two drops of the oil of peppermint being added, four table ſpoonfuls of the ſolution are given every half hour, till it operate, or be all taken. As there is generally much ſickneſs at ſtomach, it is given in ſmall doſes, leſt it ſhould excite vomiting. The eſſential oil covers the taſte of the ſalt, and renders it leſs offenſive to the ſtomach.

It is probably of no great conſequence, what kind of purgative medicine is given, provided it operate effectually and without violence. Soluble tartar ‖, Rochel ſalt §, ſena, vitriolated tartar ** and rhubarb, or cream of tartar and rhubarb may be uſed, if experience has ſhewn that they agree with a particular conſtitution. The two purging ſalts that were firſt mentioned, were generally preferred on account of their certain, ſpeedy, and eaſy operation. Glauber's ſalt keeps beſt in a warm climate; the bitter purging ſalt attracts moiſture and deliqueſces, whereby the doſe becomes uncertain, and it is preſerved with difficulty.

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* See Note E. in the Appendix.

† Natron vitriolatum, Pharm. Lond. 1788.

‡ Magneſia vitriolata, Pharm. Lond. 1788.

‖ Kali tartariſatum, Pharm. Lond. 1788.

§ Natron tartariſatum, Pharm. Lond. 1788.

** Kali vitriolatum, Pharm. Lond. 1788.

After a few ſtools have been procured, the patient generally finds himſelf much eaſier, and a remiſſion often enſues. This is to be carefully watched for, and immediate advantage is to be taken of it, for adminiſtering the Peruvian bark. The common doſe of this medicine is a drachm, which may be repeated every ſecond hour; and as a general rule in giving it, this is perhaps the beſt; but both the quantity and intervals muſt often be varied, according to circumſtances. Sometimes the ſtomach will neither bear ſo large a doſe, nor ſo frequent a repetition; and therefore, that ſickneſs and vomiting may be avoided, the quantity muſt be diminiſhed to two ſcruples, or even half a drachm; and that reduced doſe cannot perhaps be given oftener, than once in three hours. On the contrary, in caſes of great urgency, where the preceding fit has been ſevere, and there is reaſon to fear that the ſucceeding one will be ſtill more violent, and where a long remiſſion cannot be depended upon, the doſe may be increaſed to two drachms, which may be given every hour. But few ſtomachs will bear ſo much, and ſometimes the bark cannot be given at all in ſubſtance. In ſuch a caſe recourſe muſt be had to a decoction, or an infuſion. I prefer the latter, but as the decoction is ſooner prepared, I make uſe of that till the other can be got ready. The infuſion is made with two ounces of the beſt bark, reduced to powder, in twenty-four ounces of cold water; it muſt be ſtirred from time to time, and ſhould ſtand ten or twelve hours, in order to be of a proper ſtrength. Two or three ounces of it are given every two hours, or as often as the ſtomach will bear it. This preparation taken liberally, has in ſome inſtances been more efficacious than the powder itſelf, for it has prevented a return of fever, when the bark in ſubſtance has not afterwards been ſo ſucceſsful, in the ſame perſon. This I could not eaſily explain, though I was led to ſuſpect that after one or two violent paroxyſms of fever, the ſtomach was ſometimes ſo weak, that it could not act upon the bark in ſubſtance, at leaſt with ſufficient power; and that the infuſion found a more ready entrance into the circulation. The infuſion is leſs offenſive to the ſtomach than the decoction, and it is alſo ſtronger, if one may judge from the taſte; there is beſides no decompoſition of the component parts of the bark, which cannot be avoided in the decoction. Such decompoſition, it would appear from experiments made by the late Sir John Pringle, much weakens the virtues of the medicine; for, he found that the extract of the bark was not of equal efficacy with the ſimple powder, when they were given in the ſame quantity.

In ſevere attacks of the fever, in which it is abſolutely neceſſary to watch for the remiſſion, in order to make the beſt advantage of it, whenever the pulſe becomes a little ſlower, and the heat begins to abate, a doſe, or two, of the infuſion may be given, and the powder added afterwards as ſoon as the ſtomach will bear it. This, I found the moſt certain way of moderating, or preventing the next paroxyſm.

The vehicle, in which the bark is given, muſt in many caſes be ſuited to the patient's ſtomach. It will ſometimes ſit eaſy on the ſtomach when mixed with coffee, with wine and water, or with wine alone, if the remiſſion be conſiderable; in ſome caſes it anſwers the ſame purpoſe to mix it with milk, or a weak infuſion of chamomile flowers. By theſe expedients, the ſtomach is reconciled to the medicine, is enabled to receive a larger quantity of it, and to retain it better. If it be not known from experience, what vehicle is the moſt agreeable, I always make the firſt trial with the infuſion of bark, as being the moſt efficacious; and if that diſagree, recourſe is had to the others, till experience teach us which is the beſt.

It will ſometimes happen that the bark purges ſtrongly, and paſſes through the body almoſt unchanged. This is not an unfavourable ſymptom, and the remedy is eaſy, for three or four drops of the *tinctura opii* added to each doſe, ſoon put a ſtop to the purging.

When the method of cure laid down above, is carefully put in practice from the beginning, it will in many caſes prevent a return of the fever; in general, however, a ſufficient quantity of bark cannot be given in the firſt remiſſion, nor is there time for it to produce its effects upon the body, ſo as to prevent a ſecond paroxyſm.

The heat, reſtleſſneſs, anxiety, and indeed all the ſymptoms uſually accompanying the ſecond paroxyſm, are more violent than in the firſt, if nothing has been done in the remiſſion to ſtop the progreſs of the fever; but if the length of the remiſſion, and the ſtate of the ſtomach have admitted of the liberal uſe of the bark, it has a conſiderable effect upon the enſuing fit. The ſymptoms run high, but the ſtrength of the patient appears more equal to the ſtruggle; the paroxyſm is ſharp, but is of ſhorter duration, and the remiſſion that follows is of the completeſt kind.

The medicine that I have found moſt conſiderably to relieve the ſymptoms during the paroxyſms, and promote a remiſſion, is James's powder. It is given in ſmall doſes, ſeldom exceeding five grains, and is repeated every three or four hours. If the ſtomach be in an irritable ſtate, the doſe is often not larger than half the quantity juſt mentioned; for, as has been obſerved before, no ſymptom of the diſeaſe is more troubleſome or dangerous than vomiting; in the cure therefore care muſt be taken to avoid every thing, that might induce or aggravate any tendency that way. The evil that ariſes from retching and vomiting, is not confined merely to the ſufferings of the ſick, but is moſt materially felt in preventing the uſe of ſuch medicines, particularly the bark, as might ſtop the progreſs of the diſeaſe. The moſt ſalutary operation of James's powder is either to excite a ſweat, or gently open the body. There is ſeldom occaſion to give James's powder in the firſt paroxyſm, that being occupied by the purgative medicine; but if the fit continue long, as forty-eight hours, and the purge has been given, and produced the full effect, and ſtill there is no remiſſion, James's powder may be given in the manner juſt mentioned; and by exciting a ſweat, or further gently opening the body, it promotes a remiſſion of the fever.

The ſecond remiſſion, as well as the firſt, is to be employed in adminiſtering the bark freely. In this way, above two ounces of the bark may in general be got down, before the period of the fever return, which will in moſt caſes be ſufficient either to prevent entirely the next fit, or ſo far break the force of it, as to render it devoid of danger. In ſubſequent attacks the ſame courſe is to be followed; that is, ſmall doſes of James's powder are to be given during the paroxyſm, and the bark in the remiſſions.

If James's powder do not keep the body open, which it ſeldom fails to do, laxative clyſters are of uſe; for it is to be obſerved, that one or two ſtools in the twenty-four hours greatly relieve the ſick, and promote the good effects of the bark. This is particularly the caſe in the fevers ſubſequent to the rains in September and October, which are of the worſt kind. In ſuch, it is frequently advantageous to join four or five grains of rhubarb, to each doſe of the bark, in order to procure two or three motions in the day.

I have had occaſion to mention, that no ſymptoms are more dangerous than violent retching and vomiting, and nothing can be more pernicious than the uſe of emetics in ſuch circumſtances. If there be ſickneſs and vomiting in the beginning of the diſeaſe, chamomile tea, or warm water, are ſufficient to cleanſe the ſtomach. If the vomiting or retching ſtill continue after making uſe of theſe, which they will often do, and harraſs the ſick even during a remiſſion of the other ſymptoms, ſaline draughts in a ſtate of efferveſcence, repeated every hour, or oftener, will frequently allay this diſtreſſing ſymptom. The ſtomach is alſo relieved by opening the body, which further tends greatly to check the vomiting; but as cathartic medicines would be immediately thrown up, purgative clyſters are the only means that can be employed for that purpoſe, and it is ſometimes neceſſary to repeat them ſeveral times. In this way the vomiting is often quieted, and the ſtomach enabled to retain the bark.

It will ſometimes however happen in the worſt fevers, that the retchings are not abated by the efferveſcing draughts, which are themſelves thrown up. In ſuch caſes I have had recourſe to opiates, and generally with ſucceſs. From fifteen to twenty-five drops of the *tinctura thebaica* * may be added to an efferveſcing draught, or given in a little Briſtol water, and repeated in two or three hours, according to the urgency of the ſymptoms. In this irritable ſtate of the ſtomach, Briſtol water, either by itſelf, or mixed with Rheniſh wine, or Claret, will often be retained when common water would not. It has been recommended to apply a bliſter to the epigaſtric region, when the means above mentioned have failed; but I have never had recourſe to it, having always found the vomiting quieted either by the effervelcing draught, or the opiate. It muſt be obvious, that this dangerous ſymptom will often be induced, and always greatly aggravated, by any method of cure that admits of the uſe of emetics. The vomiting being overcome, the bark muſt be given with diligence, yet with caution at firſt, by beginning with the infuſion or decoction, and adding the powder as the ſtomach will bear it.

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* Tinct. opii, Pharm. Lond. 1788.

During the acceſſion of fever there is commonly more or leſs of head-ach, which ſometimes becomes extremely violent, and greatly diſtreſſes the patient. A bliſter applied between the ſhoulders, ſeldom or ever fails either to relieve, or entirely remove this ſymptom.

In the very low ſtate that was mentioned ſometimes to ſucceed violent paroxyſms, eſpecially in thoſe fevers that were attended with yellowneſs of the ſkin, nothing was ſo uſeful as cordials; for though the bark was not entirely laid aſide, yet the quantity the ſtomach would bear, in any form, was ſo ſmall, that little could be expected from it. Wine and nouriſhment were the beſt cordials, and far ſurpaſſed any from the ſhops. Claret and Rheniſh wine were moſt grateful to the ſick, and were generally preferred; Madeira was not however refuſed, if it was deſired, and it was the only wine that could be adminiſtered in that climate, to the common ſoldiers. It did not become ſour from that kind of treatment, which would have converted any other wine into vinegar. While ſpeaking of this ſubject, it may be proper to ſay ſomething of the nouriſhment to be given throughout the diſeaſe.

During the firſt attack there is generally a great loathing of food, and of wine; but in the remiſſion this is not the caſe, and both become requiſite in order to ſupport the ſtrength of the patient. Chicken broth, panada, ſago, ſalep, thin gruels, and tea in which bread has been ſoaked, are the kinds of nouriſhment beſt adapted to the ſtate of the ſtomach, and to the diſeaſe. To all of theſe, except the broth and tea, wine may be added with ſugar and nutmeg, or any other ſpice that is more agreeable. Wine is ſeldom to be given by itſelf, but ſhould be mixed with water. In almoſt every caſe, eſpecially when the diſeaſe is violent, and the patient much reduced, it is highly grateful and cordial. It is of the utmoſt conſequence in giving both nouriſhment and wine, that they be repeated often, and that only a little be ſwallowed at a time; for the ſtomach is eaſily overloaded, and provoked to vomit. After the fever begins to remit, it is better not to give the bark till ſome nouriſhment has been taken down, and of ſuch things as are mentioned above, it is left to the ſick to chuſe what is moſt agreeable. By this means the bark ſits eaſier on the ſtomach, and the ſick can better perſevere in the uſe of it. The ſame purpoſe is likewiſe anſwered by giving ſome food, or a little wine and water, between every doſe of the bark, and the ſtrength of the patient is thereby ſupported.

When the ſick are greatly reduced, after two or more paroxyſms of fever, wine and nouriſhment become more eſſential than medicine; for in ſuch circumſtances the bark itſelf does little or no good, till the powers of life are in ſome degree recruited. If it be not entirely laid aſide therefore, it ſhould only be given in a cold infuſion, to the quantity of three or four ſpoonfuls, and repeated once in two or three hours; the powder is to be added gradually as the ſick can bear it, and in ſuch manner as not to oppreſs or load the ſtomach, which would impede the uſe of wine and nouriſhment. It is of the laſt importance, to give the ſick in this way, proper nouriſhment from time to time; for, though they have no call for it, if it be omitted for even a ſhort time, they grow gradually weaker and weaker, the pulſe often indicating no return of fever, and expire, as if the whole powers of life were exhauſted by the preceding paroxyſm.

It may be aſked, in what quantity ſhould wine be given? It is difficult to give a preciſe anſwer to this; the quantity, I believe, is beſt regulated by its effects, and I have generally been guided by the following circumſtances. If it be not grateful to the ſick, but on the contrary diſagreeable, it will ſeldom do good; nor is it attended with better effects, if it increaſe the heat, reſtleſſneſs, or delirium. When it agreed well with the ſick, I have in general found the quantity, that had the beſt effects, much leſs than what is often recommended. I have rarely given above a pint in the twenty-four hours, and from watching it's effects, was well aſſured, that going beyond that quantity would have done no good, but on the contrary, harm. I do not ſpeak of the jail fever, in which wine has been recommended, and given in very large quantities; although my experience even in that diſeaſe, has not furniſhed me with caſes, where the quantity could be made with ſafety, much to exceed that mentioned above. It happens moſt unfortunately in phyſic, that we can hardly correct one error without ruſhing into another; not content with ſubſtituting wine and cordials in the room of evacuations, we muſt produce intoxication, without conſidering that in all caſes, where the human body is greatly reduced or exhauſted, the ſtrength and quantity even of cordials muſt bear a direct proportion, to the remaining ſtrength of the ſick.

If the thirſt be great, and not quenched by the thin liquors mentioned above, the ſick are allowed to drink water, or toaſt and water. When the ſtomach is extremely irritable and diſpoſed to vomit, Briſtol water is often more grateful than any other liquor, and frequently ſtays upon the ſtomach, when nothing elſe will. Acid, or aceſcent liquors, prepared from the fruits of the country have been extravagantly recommended, as highly grateful to the ſick, and ſalutary in the diſeaſe; but ſuch encomiums appear to be the reſult rather of hypotheſis, than experience. The ſick have in general no craving for them, and when given they frequently produce uneaſineſs at ſtomach. There is often indeed a diſpoſition to ſourneſs in the ſtomach, as appears from the green colour, and ſour ſmell, of what is thrown up, and this ſymptom is aggravated by aceſcent liquors.

It ſometimes happens during the paroxyſm of the fever, that there is a conſiderable degree of *ſtupor* or *coma*, which, in ſome caſes, riſes to almoſt a total inſenſibility. This being a ſymptom of the fever, whatever is uſeful in procuring a remiſſion, helps to remove it. For this particular purpoſe, I have not learned any thing more effectual than James's powder, which may be given more liberally in ſuch caſes, as in general the ſtomach is not in an irritable ſtate. It may be given in the doſe of five grains, and repeated every ſecond, or third hour, till the fever remit, or the medicine have ſome ſenſible operation. A ſtupor or coma is a mark of a ſevere diſeaſe, and ſtrongly indicates the neceſſity of making the beſt uſe of the enſuing remiſſion, by giving the bark in the moſt effectual manner, in order to check or moderate the next paroxyſm, which otherwiſe might prove fatal.

In treating the ſick, I have ſuppoſed the method of cure, to be put in practice from the beginning of the diſeaſe; but this cannot always be the caſe, as, for various and obvious reaſons, a firſt or even a ſecond paroxyſm may have paſſed, before any thing is done towards the cure. In this ſituation, if there be a remiſſion, and the preceding fit has been violent, and there is reaſon to ſuſpect that the ſubſequent one will be more ſo, it is not adviſable to loſe three, or four hours, in giving an opening medicine, which muſt therefore be omitted, and the bark adminiſtered directly. In order, however, to prevent any ſenſe of fulneſs, either in the ſtomach or bowels, which might ariſe from that medicine, and likewiſe to promote the operation of it upon the conſtitution, ſome opening medicine is joined to it, ſo as to procure three or four ſtools in the twenty-four hours. With this view four, or five grains of rhubarb, may be added to each doſe of the bark.

If a delirium, with a conſiderable degree of wildneſs and agitation, which ſometimes prevail during the paroxyſm, continue after the uſual evacuations, an opiate given in a moderate doſe, and repeated after two or three hours, will in ſome caſes have a good effect in quieting it, and thereby promote a remiſſion of the fever.

A large quantity of wind is ſometimes generated in the bowels, producing conſiderable diſtenſion and pain. Clyſters, and gentle laxatives, by promoting the expulſion of it, give relief. A drop of oil of peppermint upon a bit of ſugar, or two or three ſpoonfuls of the *Miſtura Camphoreta*, procure temporary eaſe. Though it be a deſirable thing to remove this ſymptom, yet it is not of conſequence enough to interrupt the uſe of the bark, and it will generally be ſufficient to add as much rhubarb to that medicine, as will keep the body open.

In the hiſtory of the ſymptoms it was mentioned, that there was ſometimes a ſoreneſs of the fleſh, as if beat or bruiſed. In one caſe this was particularly felt in the thighs, which were beſides cold, even during the height of the fever, though the legs and feet were hot. The pain and uneaſineſs were conſiderable, and occaſioned great reſtleſſneſs and anxiety in the patient. A *ſemicupium* was uſed, but the patient's ſtrength would not permit a continuance of it, ſo as to procure relief. Flannels wrung from boiling water were wrapt ſo hot round the thighs, that they could not be born by any other part of the body, yet they proved pleaſant and gave great eaſe. A fomentation of this kind was continued for a conſiderable time, till the fever began to remit, which it ſeemed much to promote by the eaſe it procured.

It ſometimes happens that there is a pain confined to one ſpot, with a ſenſe of coldneſs in the part; and after one or more fits of fever the part mortifies, becoming livid and dead. Inſtances of this occurred in the *ſcrotum* and foot, as has been mentioned. Of thoſe affected in the former, I knew of none that recovered; in a caſe of the latter, warm fomentations, and bottles filled with hot water applied to the part affected, gave conſiderable relief.

Opiates did no good. When the part became livid and inſenſible, it was ſcarified, in order to diſcharge a thin ichorous matter, which procured ſome eaſe. The fever was checked by the uſe of bark, and the patient recovered, with the loſs of one toe; but he was ſubject to relapſes for a long time, and did not regain his ſtrength for ſeveral months.

When a ſeaſon proves unhealthy, more particularly at the moſt ſickly time of the year, relapſes are very frequent. They are ſometimes ſlight, ſometimes ſevere, but never devoid of danger; for repeated attacks undermine the conſtitution, and end in dropſies, or indurations of the liver or ſpleen; or perhaps one fit, more ſevere than uſual, puts an end to the life of the patient. In ſuch caſes the treatment, during the fever, is the ſame as is laid down above; that is, an opening medicine in the beginning, James's powder as occaſion may require to haſten a remiſſion, and afterwards the bark: for it is to be obſerved, that thoſe relapſes conſiſt of two or more feveriſh fits, and remiſſions between. When the conſtitution becomes liable to relapſes, which ſometimes take place with a degree of regularity every two, three, or four weeks, it is of great advantage to procure a change of air, or what is ſtill better, repeated changes of it by travelling. Eaſy journies in the cooler and mountainous part of the country, continued for ſome time, are very efficacious in reſtoring ſtrength and vigour to the conſtitution; and in enabling it to reſiſt future returns of the diſorder.

The air of Port Royal, which ſtands upon a bank of ſand, that is nearly ſurrounded by the ſea, is pure and healthy, and is frequently of great benefit to invalids, from the neighbouring towns of Kingſton and Spaniſh Town; though in the temperature of the air there be little difference between the three places. Port Royal would be ſtill more healthy, were due attention given to remove dirt and filth from the ſtreets.

Such however is the deep root that the fever ſometimes takes, that the relief procured by a change of air is of ſhort duration, and repeated attacks ſtill threaten to prove fatal. Under ſuch circumſtances a ſea voyage is highly beneficial, and will often accompliſh what a change of air alone could not; eſpecially if the time of being at ſea can be prolonged to ten or twelve weeks. It was imagined

gined at one time, that this might have been turned to the advantage of the common ſoldiers, by ſending the convaleſcents to make a cruize on board the ſhips of war; and ſome men, belonging to the 1ſt battalion of the 60th regiment, were accordingly ſent to ſea. But being unable to lay in ſea ſtock, and not knowing how to take care of themſelves on board of ſhip, they all returned with the ſcurvy, though free from fever; upon which the plan was laid aſide.

The air at ſea, in the Weſt Indies, is free from all the pernicious qualities of the air on ſhore, and there is no climate where ſeamen enjoy better health, provided they remain conſtantly on board of ſhip, and attention be paid to keep the ſhip clean, and to ſupply the men from time to time with vegetables or fruits, to prevent the ſcurvy. The fineneſs of the weather makes it ſeldom neceſſary to ſhut the port-holes, and therefore they do not ſuffer from foul and confined air; and almoſt all the iſlands afford ſupplies of fruits, greens, and eſculent roots. The ſhips of war, on the Jamaica ſtation, often enjoy better health than in the Engliſh Channel. This being the caſe, it may be aſked how it happens that we loſe ſo many of our ſeamen in the Weſt Indies? It is owing to the following cauſes, as far as I could obſerve, on the Jamaica ſtation, to which my remarks particularly refer, though, I doubt not, they will equally apply to the other iſlands.

Sailors when ſent on ſhore, either for the purpoſe of taking in water, or on any other duty, are expoſed to the cauſes that produce the fevers of the country; and in general they give additional efficacy to them, by their own irregularities. It would further ſeem, that coming from a pure air into one that is noxious, they are nearly in the ſame ſituation as new-comers, who are ſooner affected, and ſuffer more from fevers than others, as was mentioned before. In taking in water at the watering-place for the navy, in the harbour of Kingſton, it has frequently happened, that every man employed on that ſervice has been ſeized with a fever, in the courſe of a few days; and although this be not always the caſe, it is very rare that the larger proportion do not ſuffer. Again, the men of war ſupply the deficiency of their complement by preſſing the ſailors from the merchant ſhips; to avoid which, many of the men leave their ſhips as ſoon as they make the land, and lurk in the country or towns, till an opportunity offer of getting on board a trading ſhip, or till they fall into the hands of a preſs-gang. Thoſe men, as well as the ſailors employed in the preſſing duty, are all expoſed to the uſual cauſes of ſickneſs, and after going on board the king's ſhips, many of them are ſeized with fevers. This has been particularly remarked, in thoſe ſhips that have been manned entirely in Jamaica; which happened, when ſhips taken from the enemy were bought into the ſervice of government; and upon ſome occaſions of this kind, the mortality has not been leſs among the officers than the men, owing, apparently, to the former having taken an active part in the preſſing ſervice. I am not ignorant that it has been ſuppoſed, that the foul ſtate of the ſhips taken from the enemy, has produced contagious fevers, to which the mortality alluded to has been imputed. But it is worthy of remark, that there was no contagious fever among the enemies' men, while on board the ſame ſhips; and that though they were dirty, there was no confined air, and it is the latter only that is known to produce what are called contagious fevers. But what appears to be of more force than either of thoſe arguments is, that many of thoſe who died had the yellow fever, which is ſufficiently characteriſtic of the diſtemper of the country, and is an appearance rarely to be met with in contagious fevers.

Beſides the preſſing and the watering ſervices, there are many ſmaller matters that render it neceſſary to ſend boats aſhore, and without particular care the men will ſtraggle into the country, or about the towns, which is rarely done with impunity, eſpecially at the unhealthy ſeaſon of the year. Ships may likewiſe become unhealthy, though none of their men go on ſhore, if ſtationed near to marſhy ground, and to leeward of it. To thoſe cauſes, which introduce fevers into the fleet, may be added another ſource of the mortality, which prevails among our ſailors in the Weſt Indies, that the ſurgeons of the navy are not ſupplied with the moſt eſſential medicine for their cure, at leaſt in proper quantity; I mean the Peruvian bark: nor can they afford to purchaſe it in that part of the world *.

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* It ſometimes ſells for two guineas a pound.

Having thus ſtated ſhortly, the principal cauſes of mortality, in the fleet in the Weſt Indies, it will not be deemed digreſſing too far, to mention in a few words the remedies that may be uſed to counteract them.

I. Sailors ſhould not be allowed to go on ſhore, when it can poſſibly be avoided.

II. Negroes ſhould be employed for the watering ſervice.

III. The ſurgeons ſhould have an allowance of bark from government, while upon that ſtation.

In order the better to reconcile the ſailors to remain on board of ſhip, while in harbour, market boats under proper regulations ſhould not only be allowed, but encouraged to come to the ſhip, that they may have an opportunity of laying out their prize-money, in whatever articles they pleaſe, that are not pernicious to them.

The purchaſe of Negroes for the watering ſervice would be a conſiderable expence, but nothing when compared to the loſs ſuſtained by the death of ſo many ſeamen, rating them merely at the ſum they coſt government, and laying aſide ſuch conſiderations as are derived from humanity. The life of a ſailor in the

Weſt Indies cannot be rated at leſs than fifty pounds; and even at that computation, which is much too low, the number loſt in watering a few line of battle ſhips, far exceeds the expence of purchaſing negroes. But a ſufficient number might be provided with no additional expence, if every ſhip were to have a certain proportion of negroes, according to their complement, as one in twenty or twenty-five. They might be hired of their maſters, or entered if free, and turned over by the ſhips leaving the ſtation, to thoſe that arrived there. A ſimilar practice is found very uſeful in the army. All the negroes, on board the ſhips in the harbour, might when needful be employed in filling water; nor would they, like Europeans, ſuffer from fevers; for, though not entirely exempted from that diſeaſe, they are but ſlightly affected by it.

The expence of ſupplying the navy ſurgeons with bark, is too inconſiderable to be any juſt bar to a plan, which has for its object, a matter of ſo much conſequence, as that of ſaving the lives of our ſeamen.

To return to our ſubject; a voyage to ſea often entirely reſtores the health, and ſeldom or ever fails to procure a conſiderable temporary amendment. Should however the fever ſtill return in a formidable way, there is but one thing remaining to be done, which is, to go to a colder climate, either in Europe or North America. The health is generally much improved during the voyage, and in a cooler and more healthy climate, is often completely re-eſtabliſhed in a few months. But this is not always the caſe, for the conſtitution is ſometimes ſo materially injured, as not to admit of a ſpeedy reſtoration. The ſick remain ſubject to returns of fever, at various intervals, for the ſpace of ſix, twelve, or even eighteen months after their arrival in Europe. The attacks, it is true, are neither ſo violent, nor ſo frequent as they would have been in the Weſt Indies, but ſtill they are conſiderable enough to prevent the recovery of ſtrength, and to keep the ſick in a ſtate of great languor and dejection. During the feveriſh fits the ſtomach and bowels are often much diſordered, and if vomiting be excited, more or leſs of bile is brought up, and from this circumſtance ſuch perſons are ſaid to be bilious. The ſalutary influence of a cold climate will, in moſt caſes, gradually reſtore health; the good effects of it are however promoted by gentle exerciſe, in the open air when the weather is fine, as riding on horſeback; by opening medicines of an eaſy operation, during the attacks of fever; by the occaſional uſe of bitters, bark, and chalybeate medicines to ſtrengthen the ſtomach, and conſtitution; and by ſea-bathing during the warmer months.

To return to the treatment of the fever in Jamaica, it was mentioned that the bowels were at times affected with dyſenteric ſymptoms: if they were ſlight, they ſometimes yielded to the purgative given in the beginning; but when they did not, ſomething of an opening nature, as a few grains of rhubarb, was added to the bark. If the affection of the bowels did not give way to this, and the dyſentery might be ſaid to conſtitute the principal diſeaſe, the method of cure was the ſame as will be mentioned, in treating of that diſeaſe.

When there was a combination of cat-boils with fever, the former required no particular treatment; care however was to be taken that no violence was offered to them; for if an attempt was made to ſqueeze them, or if they were near a joint that was neceſſarily much in motion, as the elbow-joint, they became exceſſively painful, inflamed all round, and formed a real carbuncle.

Of the tetanus, as a ſymptom of fever, I have little to obſerve. The methods of cure hitherto recommended in every ſpecies of this diſeaſe, are at leaſt uncertain, if not altogether inefficacious. A new remedy anſwered well in one caſe, and although little can be inferred therefrom, it may deſerve to be noticed in a complaint, where our knowledge is ſo limited. It conſiſted of an electuary made of the flower of muſtard [*] and common ſyrup, of which one or two tea ſpoonfuls were given every two hours, or even every hour if the throat and ſtomach would bear it. In two days the ſymptoms yielded, the patient could open his jaw, and the rigidity of his limbs and body went off; the medicine was therefore laid aſide. But in leſs than two days the ſymptoms recurred, the electuary was given as before, and again the diſeaſe ſeemed to yield to it. Whether this was to be aſcribed to the medicine, or was merely fortuitous, muſt be determined by future trials. Hippocrates orders black hellebore and pepper in this diſeaſe *.

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[*] I was led to make trial of this in conſequence of a converſation with the late Dr. H. Saunders, who ſaid he had heard it had done good in tetanus.

In the caſe of hydrocephalus, that was a conſequence of the fever, bliſters to the forehead, temples, and back were ineffectually applied; and it was intended to have given *calomel* in ſmall doſes, as the moſt probable means of promoting an abſorption of the water, but the patient died before a trial of it could be made.

The fever has many intermediate degrees of violence, between the ſevere attack that puts an end to life in one or two days, and a form ſo ſlight, that the preſence of a fever is hardly ſuſpected. There is laſſitude, a want of the uſual appetite for food, diſturbed ſleep, and, what is chiefly characteriſtic of the fever, a white tongue. Such ſymptoms will continue for ſeveral days, without giving any alarm, though they are always ready to be converted into a ſevere illneſs, when aided by an additional cauſe. A doſe of phyſick will often remove them all, and a gentle emetic will frequently have the ſame effect; but the former was commonly preferred, as being fully more effectual, and eaſier in its operation. James's powder, given in the quantity of eight or ten grains at bed-time, and repeated for two or three nights, will often reſtore the health, without producing any ſenſible operation. One particular advantage derived from it, is to take off the heat and reſtleſſneſs, which are extremely troubleſome in the night. Travelling by eaſy journeys, or making ſhort excurſions from the uſual place of reſidence, are highly beneficial, and will often completely re-eſtabliſh the health.

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* De Morbis, lib. iii.

Before I conclude, it may be allowed to obſerve, that the practice had two leading objects in view; to procure a remiſſion; and to prevent a return of the fever. The firſt was obtained chiefly by opening medicines, and James's powder; the ſecond was accompliſhed by the bark in different forms. The advantages of this practice over that, in which more time is ſpent in cleanſing the *primæ viæ*, as it is expreſt, and where the firſt remiſſion is uſually ſacrificed to that purpoſe, are, that the fever is ſooner checked, the conſtitution of the patient ſuffers leſs, the recovery of ſtrength is quicker and more complete, and relapſes happen leſs frequently. The longer the fever continues, the more miſchief is done; nor is there the ſmalleſt appearance of its having a regular progreſs towards a criſis, to wait for which would be time irretrievably loſt. The means of cure are few and ſimple; the greateſt difficulty is in watching the proper times of uſing them, and in adminiſtering them with diligence and aſſiduity. I found them ſo ſeldom diſappoint me, that there were few beſides of the long liſt of medicines, uſually recommended in fevers, to which I had recourſe. As the practice however was not reduced all at once to ſo much ſimplicity, but at firſt trials were made of ſeveral of the remedies in common uſe, it may not be improper to mention ſhortly the reſults of them.

Blood-letting well deſerves to be conſidered in the firſt place. In ſuch caſes as ſeemed moſt to require it, for example, where the patient was young, ſtrong, of a full habit, and lately arrived from Europe; where the pulſe was quick and full, the face fluſhed with great heat and head-ach, and all theſe at the beginning of the fever, bleeding did no good. It neither diminiſhed the ſymptoms for the time, nor procured a ſpeedier remiſſion. I cannot ſay, however, that it did that miſchief that has been imputed to it by ſome; for, provided it were in a moderate quantity, it could hardly be ſaid to produce any ill conſequences. But if it were copious, or repeated a ſecond time, it was always hurtful, and rendered the recovery of the patient extremely ſlow, if not attended with worſe conſequences. This effect it had in the inflammations of the lungs that ſometimes happened, in which it was neceſſary to bleed freely. It will not be conſidered as a recommendation of bleeding to ſay, that there were ſome caſes in which it did little or no harm, if uſed moderately; yet ſuch is the concluſion, to which the obſervations, I had an opportunity of making, lead me. The general uſe of copious bleedings in fevers, in which there is no local inflammation, would indeed appear to have been introduced into practice upon hypothetical principles. A fever was ſuppoſed to depend upon a fermentation in the blood and humours, whereby great commotions were excited, like to what happens in fermenting liquors, and by drawing off part of the blood, it was intended there ſhould be more room for the remainder, to go quietly through the proceſs of fermentation,

tation, and deſpumation. Sydenham * gave ſome ſanction to theſe ill-founded opinions, and they were afterwards carried to greater lengths, and wrought into a ſyſtem by the genius of Boerhaave †, in whoſe ſchool it was an axiom, almoſt without exception, to bleed in the beginning of fevers.

Vomits are much uſed in fevers in the preſent practice, but I did not find them of advantage in the Remittent Fever of Jamaica; on the contrary, when that diſeaſe is violent, the worſt ſymptom is a retching or vomiting, which is greatly aggravated by emetics; and under ſuch circumſtances they are inadmiſſible. But when the ſtomach is not in an irritable ſtate, and there is little or no diſpoſition to vomiting, it is eaſily excited by an emetic, and often allayed with difficulty. In all caſes a vomit ruffled and fatigued the patient more than a purge, without procuring equal relief; and if a vomit were given during the paroxyſm of the fever, it was generally deemed neceſſary afterwards to give a purgative, before the bark could be adminiſtered; by which a whole remiſſion was often loſt. The notion entertained

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* Sydenham, Febr. Contin. an. 1661, 62, 63, 64.

† Boerhaave Aphoriſm. 615.

tained by ſome, that bile is the cauſe of the fever led to a frequent uſe of vomits, and ſometimes with the moſt pernicious effects; for the ſtomach was rendered ſo irritable thereby, that wine, nouriſhment, or even a glaſs of water could not be retained, but were thrown up almoſt as ſoon as ſwallowed. Emetics given in ſmall doſes, and repeated at ſhort intervals, ſo as to excite and keep up for ſome time a nauſea or ſickneſs at ſtomach, were not leſs pernicious than when employed for the purpoſe of evacuating the bile. In both caſes the ſtomach was rendered incapable of receiving the bark, the only medicine we are yet acquainted with, that poſſeſſes power to ſtop the progreſs of the fever.

I did not find, that I could by any means contrive to give the emetic tartar ſo, as to produce the ſame effects as James's powder; the peculiar advantage of which is, that it does not ſo readily affect the ſtomach as emetic tartar, but operates chiefly by purging, or ſweating. Theſe effects probably depend upon its being a calx, and not a ſaline preparation, of antimony. A ſaline preparation being in a ſtate of perfect ſolution affects the ſtomach directly, whereas a calx acts ſlowly, and paſſes into the bowels before it produces its full operation. James's powder appears, however, to be ſuperior to any preparation of the *antimonium calcinatum*, that we are yet acquainted with, which is probably owing to the proceſs by which it is made, being of that kind that determines exactly the degree of calcination, upon which the virtues of antimonials are known chiefly to depend.

The red Peruvian bark was not found more effectual than the common kind; on the contrary, there were conſiderable objections to the uſe of it in the cure of the remittent fever. It frequently affected the ſtomach and bowels, producing ſickneſs, and ſometimes vomiting, with flatulence, griping, and purging. Thoſe effects were often troubleſome, and retarded the cure; the common bark was therefore, after making comparative trials, preferred to the red bark. The prejudices, that formerly exiſted againſt the Peruvian bark, are no longer in being. They were founded in idle ſpeculations, and originated with the learned, from whom they deſcended to the great body of the people; but even with the vulgar they are now extinct. Any attempt to prove, that the obſtructions of the *viſcera* are the effects of the diſeaſe, and not of the medicine, would at this time be deemed impertinent. The greateſt and indeed the only evil ariſing from the bark, that has fallen under my obſervation, has been to excite ſickneſs, nauſea, and vomiting, when it has diſagreed with the ſtomach. Thoſe effects it generally produces, if it be given during the paroxyſm of the fever. A deſire to adminiſter early this great ſpecific, ſometimes led to a practice of this kind, but nothing was gained by it, as it was almoſt always rejected by the ſtomach. Nay, there was ſome danger of raiſing a diſguſt in the patient to the medicine, which might continue during the remiſſion.

Bliſters were often applied by ſome in the cure of the fever. It will be obvious, that there muſt be a degree of uncertainty, in appreciating the effects of a remedy, which does not complete its operation in leſs than twelve or fifteen hours, in a diſeaſe that conſiſts of remiſſions and exacerbations, following each other at no fixed or regular periods. Under ſuch circumſtances, remiſſions muſt often occur during the operation of the bliſters, but there was no reaſon to think that they were promoted by them; and the bliſters certainly had no effect in preventing future attacks of fever. In caſes of great ſtupor and inſenſibility, where it might have been expected they would have been moſt uſeful, they did no good. When the fever was violent, and the paroxyſms long, it frequently happened that the bliſters roſe well, and produced their full effect, yet the fever went on, as if no ſuch application had been made. Finding that they neither ſhortened the fit, nor prevented future returns; that the diſcharge from them was often ſo conſiderable, from the diſſolved ſtate of the blood, as greatly to weaken the ſick; that they frequently produced ulcers that were healed with much difficulty, and ſometimes mortifications that proved fatal; I laid aſide the uſe of them entirely, unleſs the ſick were diſtreſſed with a bad head-ach, for which ſymptom they were in ſome ſort a ſpecific. The ſame objections were found to hold good againſt ſinapiſms.

The claſs of alexipharmic and cordial medicines, I made little or no uſe of, having found wine to be not only more grateful to the ſick, but alſo much more effectual in anſwering all the purpoſes, for which ſuch medicines are given.

SECT.

SECT. III. *Of the Nature and Cauſes of the Remittent Fever.*

I HAVE purpoſely avoided conjectural, or ſpeculative reaſoning on this diſeaſe, and have confined myſelf to a ſimple narrative of ſymptoms, appearances, and effects of medicine, as learned from obſervation and experience. Theoretical diſquiſitions into the nature and cauſes of diſeaſes have often done much miſchief, and ſeldom any good. Our knowledge of the animal economy is hitherto ſo limited, that it enables us to make little or no progreſs in ſuch undertakings; and analogies from chemiſtry, mechanics, and other ſciences, however well imagined, or ſpeciouſly decorated, have been found unequal to the explanation of the *phænomena* of living bodies. It may be a queſtion, whether all ſuch inveſtigations ſhould not be excluded from the ſtudy of phyſic; and there are many that would not heſitate to anſwer in the affirmative. But there is conſiderable difficulty in this; the mind cannot make obſervations without comparing them, without tracing their reſemblances, and marking their relations; and unleſs reſtrained by the laws of true philoſophy and juſt induction, it haſtens to concluſions that muſt be erroneous, becauſe derived from inadequate *data*. To this impatience of the human mind under doubt and uncertainty it is to be imputed, that, from the earlieſt annals of Phyſic, various doctrines, generally derived from the prevailing philoſophy of the time, have been adopted as principles, from which the nature and cauſes of diſeaſes have been attempted to be explained. With how little ſucceſs, but too plainly appears from the diſcordant opinions of Writers, Teachers, and Phyſicians on ſuch ſubjects. It is far however from being my intention to ſuggeſt, that the human mind is altogether unequal to ſuch inquiries; on the contrary, whenever they ſhall be conducted in the ſame way, that has ſo much extended ſcience in other branches of natural knowledge of late years, there can be no doubt of their ultimate ſucceſs. But that phyſicians in general have been tardy in adopting, and reluctant in applying to their art, the rules of juſt reaſoning by ſober induction, is a reproach from which, I fear, we cannot be vindicated.

In inveſtigating the nature and cauſes of the remittent fever, I deem it of more importance to examine the opinions of others, than to advance notions of my own; and if it be conſidered, that the received idea of the cauſe of a diſeaſe has generally great influence in directing the practice, the preſent inquiry will not be thought altogether uſeleſs.

That the bile is the cauſe of the remittent fever, is an opinion more commonly received than any other; it is of the higheſt antiquity. In a diſeaſe that uſually begins with ſickneſs and vomiting, the diſcharge of a fluid poſſeſſing ſuch peculiar properties, both as to taſte and colour as the bile, could not fail to make a ſtrong impreſſion on the firſt obſervers. It was natural for them to conclude that, that fluid, which they had ſeen nothing of while the body continued in an healthy ſtate, was the cauſe of the diſeaſe; and the relief the ſick are ſenſible of, from the ſweating that uſually follows the retching and vomiting, and the conſequent diſcharge of bile, would confirm them in this opinion. It could not be long, however, before they would learn that the bile was a natural ſecretion, which was conſtantly going on in an healthy ſtate, and therefore that the fever could not be imputed ſimply to the preſence of bile, for then nobody would be without a fever. It was ſuppoſed, that the bile was in fault either in quantity, or in particular acquired qualities. It was either acrimonious, putrid, or in too large a quantity; or perhaps faulty in all thoſe reſpects. Such are the opinions delivered by the oldeſt medical writers, and they are received by many of the preſent day with little variation, and conſidered as applying particularly to the remittent fever.

That the bile in a natural ſtate is perfectly harmleſs, at leaſt as far as relates to the production of fevers, we have daily proofs, in its being moſt intimately diffuſed all over the body in jaundice, without exciting any febrile diſorder. The proofs of this fluid being in a putrid, or acrimonious ſtate, are taken from the changes it undergoes in colour and conſiſtence. The natural colour of it is yellow, but it is often vomited green, and ſometimes of a dark brown colour, or almoſt black, and of a ropy conſiſtence. The quantity has generally been ſuppoſed to exceed what is natural; yet I apprehend it is not an eaſy matter to aſcertain, how much bile is ſecreted in an healthy perſon, and unleſs that could be done, it is difficult to ſay, at what point the quantity diſcharged, exceeds that of the healthy ſecretion.

The green colour of the bile is known to depend upon an acid in the ſtomach; for experiments have taught us, that the moſt healthy bile would acquire a green colour, if mixed with an acid liquor. That an acid is often generated in the ſtomach we have daily proofs, both in the ſour taſte of what is brought up from the ſtomach, and in the teeth being ſet on edge by it. I have ſeen an inſtance of fever, in which it was neceſſary to give from half an ounce to ſix drachms of the powder of oyſter-ſhells, to deſtroy the acid that was generated in the courſe of the day, which otherwiſe occaſioned great pain and retchings. The green colour therefore is not to be imputed to any acrimony, or other bad quality in the bile, but to diſeaſe in the ſtomach.

The dark brown colour of the bile, and ropy conſiſtence, are nothing more than natural changes, produced by its ſtagnating for ſome time in the gall-bladder and biliary ducts. The thinner parts of the bile are abſorbed, and what remains becomes both of a deeper colour, and thicker conſiſtence, as happens in other ſecretions.

The bile is not a fluid that has a ſtrong tendency to putrefaction, but the contrary; and there are no facts to prove that it is ever thrown up from the ſtomach in a putrid ſtate; it is not therefore conſiſtent with the rules of juſt reaſoning, to ſuppoſe ſuch a ſtate for the purpoſe of explaining the *phænomena*.

The great quantity of bile, that is often diſcharged, is to be attributed to the retching and vomiting. In ſea-ſickneſs the quantity of bile that is thrown up, is often as conſiderable as in the remittent fever, yet it cannot be ſuppoſed to be the cauſe of ſea-ſickneſs or vomiting, but, on the contrary, is the effect of them; and, though diſcharged moſt profuſely, is never accompanied with any fever. A vomit, that operates ſtrongly, never fails to bring up a large quantity of bile, which does not appear till after repeated ſtrainings and retchings: the uſual contents of the ſtomach are firſt diſcharged, and after a time the bile. The progreſs is the ſame in the remittent fever, the contents of the ſtomach are firſt thrown up, and if the vomiting continue, the bile afterwards makes its appearance. So far, therefore, is it from being the cauſe of the ſickneſs and vomiting, that it does not even find its way into the ſtomach, till the ſtraining has continued ſome time. The large quantity thrown up may depend on two cauſes; the violent vomiting, which in all caſes excites a moſt copious flow of bile; and the operation of digeſtion being at a ſtand, the flow of the bile into the duodenum is not promoted; for the diſtenſion of the ſtomach by the food occaſions a compreſſion of the gall-bladder, which not taking place, the bile is collected in a large quantity, and when vomiting comes to be excited, is of courſe more copiouſly diſcharged. It is in this way that Morgagni * explains, why the gall-bladder is often found diſtended with bile after death; but I am inclined to think that there are other circumſtances, that ſhould be taken into the account. Glands, and excretory ducts have their peculiar *ſtimuli*, which excite their actions, and produce a copious flow of their ſecreted liquors. Thus, the ſaliva flows as ſoon as any thing ſapid or grateful is taken into the mouth; and tears run from the eyes when certain pungent effluvia fill the noſtrils, ſuch being ſufficient to excite the action of the lachrymal glands. There is reaſon to think that the ſame principle holds in the more internal glands, whoſe operations we cannot ſo well obſerve; and that the food taken into the ſtomach excites the ſecretion of the gaſtric juices, and after paſſing through the pylorus proves a ſtimulus equally powerful, in promoting the flow of the pancreatic juice and bile into the duodenum, there to be mixed and blended together, for purpoſes in the animal œconomy, which we do not yet underſtand. It is probable therefore, that this natural action contributes more to the evacuation of the gall-bladder, than any mechanical preſſure of the ſtomach; and when digeſtion is at a ſtand, the bile of courſe will accumulate, till it be diſcharged by vomiting or purging. The collection and ſtagnation of the bile produce the deep colour and ropy conſiſtence, which it ſometimes acquires. It deſerves to be remarked, that in the ſtage of the fever which is moſt commonly imputed to bile, the firſt marks of the diſeaſe are loſs of appetite and ſlight ſickneſs at ſtomach [*], which are often preſent for a whole day before the attack of fever, and during that time the bile is collecting, and accumulates in the ducts and gall-bladder.

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* Morgagni de Sedibus & Cauſis Morb. Ep. 68. § 3.

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[*] Vide p. 76.

Thus, the quantity of the bile, as well as its ſuppoſed bad qualities, depending upon cauſes that have no neceſſary connection with the remittent fever, and occurring wherever thoſe cauſes are to be met with, even where there is no fever, it is not allowable to impute to bile, or any change it is yet known to undergo, the production of remittent fevers. There are not wanting other proofs to ſhew, that the diſcharge of bile is merely an accidental ſymptom; for caſes frequently occur where no bile is thrown up at all, and yet the fever is as regularly formed, and as violent, as when that fluid is diſcharged in large quantities. Indeed the diſcharge of bile is often intirely owing to the uſe of emetics, and is always greatly increaſed by them. It would be of little moment to inveſtigate this ſubject, did it not involve opinions productive of the worſt conſequences, in the treatment of the diſeaſe. If bile, whether putrid, acrid, or ſuperabundant, be the cauſe of fever, can any thing be ſo proper as to promote the diſcharge and evacuation of it by vomits? Emetics, therefore, upon this ground are given, and repeated; and as bile is diſcharged every time, an argument is thence deduced for their future repetitions; without reflecting that while life remains, a ſtrong vomit will always bring up bile, in the ſame manner that any irritation upon the eye would produce a flow of tears. But in the remittent fever of Jamaica there is not room for many repetitions of vomiting, except in ſlight caſes indeed; for the irritability of the ſtomach peculiar to the diſeaſe, if increaſed by an emetic, renders it impoſſible for a time, to adminiſter any medicine to check the progreſs of the fever, and a ſecond or third attack under ſuch circumſtances will generally prove fatal *.

While it has been generally agreed to conſider the bile as the cauſe of the remittent fever, a ſymptom of the diſeaſe ſo remarkable as to give riſe to a new name, I mean the yellowneſs of the ſkin, in conſequence of which it is called the *yellow fever*, has been derived from another ſource, and not imputed to the bile; though that be the only cauſe we are hitherto acquainted with, which produces a yellowneſs of the ſkin. The colour of the ſkin, in the yellow fever, has been ſuppoſed to ariſe from a putrid and diſſolved ſtate of the blood.

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* See note F in the Appendix.

In ſpeaking of the ſymptoms of the diſeaſe, it was obſerved, that the yellowneſs firſt appeared in the eyes, then upon the neck and ſhoulders, and at laſt all over the body, holding exactly the ſame progreſs as in the jaundice. At the ſame time that the ſkin becomes yellow, the urine is voided of a deep colour, and tinges a bit of linen rag yellow, as in the jaundice. When the ſick recover from the fever, the colour gradually diſappears as in that diſeaſe. The progreſs of the ſymptoms, as far as reſpects the yellow colour, being exactly ſimilar in the remittent fever and the jaundice, it is conſiſtent with reaſon to believe, that the colour proceeds from the ſame cauſe in both, that is, from the bile being abſorbed, and carried by the lymphatic veſſels into the general maſs of circulating fluids. In jaundice the bile is abſorbed when the ducts, that ſhould convey it into the duodenum, are obſtructed. The moſt common cauſe of obſtruction is undoubtedly biliary *calculi* or concretions, and ſometimes ſcirrhous tumours compreſſing the ducts. It is not ſo obvious, what the cauſe of obſtruction is in the remittent fever; but before hazarding any conjecture upon that head, it may not be improper to conſider, what foundation there is for the opinion, that the yellow colour depends upon a putrid or diſſolved ſtate of the blood.

Without examining whether the term *putrid* can be applied with propriety to the blood, while in the living body, the preſent queſtion may be confined to this point; how far the yellow colour can be produced by any change of the blood, whether induced by putrefaction, or a diſſolution of its ſubſtance. A putrid and diſſolved ſtate of the blood, as it is commonly expreſſed, occurs chiefly in the advanced ſtages of ſea-ſcurvy, in certain fevers, and in ſome morbid and undeſcribed conditions of the body. In all thoſe the blood is known to be in a diſſolved ſtate, by oozing through the veſſels, and ſometimes through the pores of the ſkin, and producing ſpots of various kinds upon the ſkin. There is perhaps no diſeaſe, in which the blood is in a more diſſolved ſtate, than in the ſea-ſcurvy; yet it never produces a yellow colour of the ſkin in that diſeaſe. The diſcolouring is not uniform, but in ſpots or wheals, which are at firſt read or a purpliſh black, or of ſome intermediate ſhade, the colour being more or leſs deep according to the quantity of blood that is effuſed. The ſame thing is obſervable in the diſſolved ſtate of the blood, that happens in fevers; and in neither is the colour of the eye affected. When the ſpots begin to diſappear they leave indeed a yellow tinge in the ſkin, like to what happens after a bruiſe; but this yellowneſs is confined to the ſpots, has a marbled appearance, and is not generally diffuſed over the ſkin. The diſſolved, or as it is called, putrid ſtate of the blood, being incapable of producing the yellow colour in the eyes and ſkin, and the abſorption of the bile being the only cauſe we are hitherto acquainted with that can produce thoſe effects, there is no reaſon to doubt, that it is the cauſe of the yellowneſs, and that the yellow fever is in no other reſpects to be diſtinguiſhed from the remittent fever, than in having a jaundice ſuperadded *.

Next to the opinion that the fever proceeds from bile, none is more prevalent than

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* See note G in the Appendix.

that it is of a putrid nature; and that the whole maſs of humours are running violently into putrefaction. If it be aſked what is meant by the term *putrefaction*, it will doubtleſs be anſwered, that ſpecies of fermentation or change, which dead animal matter in a certain degree of heat and moiſture, joined to an admiſſion of air, ſpontaneouſly undergoes. That ſuch is the acceptation of the term cannot be doubted, when it is obſerved that in reaſoning on this ſubject, whatever is found to check putrefaction out of the body, is ſuppoſed to have the ſame effect taken internally, and is therefore recommended in diſeaſes believed to be putrid; and whatever promotes putrefaction out of the body, is ſuppoſed to be noxious, and is therefore avoided. Putrefaction diſſolves bodies, and the diſſolution is accompanied with an offenſive ſmell. In the fever, the blood is ſometimes in a diſſolved ſtate, and there often proceeds from the body of the ſick a peculiar ſmell, extremely diſagreeable: ſo far there is a reſemblance, but it goes no farther. In the dead body the firſt ſigns of putrefaction are an offenſive ſmell, and change of colour in the ſkin of the abdomen, which becomes greeniſh.

There is no ſimilar change in what is called the putrid fever. It may be alledged, that putrefaction is a different thing in the living, and in the dead body. But if this be admitted, and putrefaction in a living and in a dead body are allowed to be different proceſſes, inferences drawn from one can never be applied to the other, and the greater part, if not all, of the reaſoning adduced on this ſubject, muſt fall to the ground.

Were it to be granted, that the diſſolved ſtate of the blood was the effect of putrefaction, there would ſtill be no good ground to infer, that it was the cauſe of the fever. It is conſiſtent with reaſon, that the magnitude or intenſity of the cauſe, ſhould be proportioned to the greatneſs of the effect. In all caſes, therefore, of the fever there ſhould be ſome marks of putrefaction, and a violent degree of the diſeaſe could not be ſuppoſed to exiſt without them; yet this is by no means agreeable to obſervation. In many of the worſt caſes of fever, and which ſuddenly prove fatal, there are no appearances of the blood being in a diſſolved ſtate, nor are there any other marks of putrefaction. How then can putrefaction be ſuppoſed to be the cauſe of a diſeaſe, which often exiſts in the moſt violent degree, and frequently puts an end to life, without the fainteſt traces of the exiſtence of ſuch a proceſs?

If we examine more minutely into this ſubject, it will appear, that the opinion of the putrid nature of the diſeaſe is founded on a vague analogy, which will not ſtand the teſt of experiment, or obſervation. The diſſolved ſtate of the blood has been conſidered as the moſt unequivocal mark of the preſence of putrefaction; but the diſſolution of the blood in ſcurvy has been found not to proceed from putrefaction, for ſuch blood does not putrify ſooner than any other, which it ought to do, if already in a putrid ſtate, when taken out of the body*. If the diſſolved ſtate of the blood in ſcurvy do not depend on putrefaction, there is little reaſon to ſuppoſe, that in fevers it is owing to that cauſe. The diſſolution often takes place in the courſe of a few hours, which cannot be explained from any thing obſerved to happen in putrefaction, which is a proceſs that goes on ſlowly and regularly. The offenſive ſmell proceeding from the perſons of the ſick, which is believed to depend upon putrefaction, is very different from that which ariſes from dead ſubjects in a diſſecting room, as will be readily admitted by any one that has had experience of both; yet they ought not to differ, if they both depended on the putrefaction of an animal body. But farther, it often happens that the dead bodies have ſo little of an offenſive ſmell, that it has been matter of ſurpriſe to thoſe that have opened them *. There appears indeed to be no foundation for believing, that putrefaction is the cauſe of the remittent fever, or of any of its ſymptoms, either when in the mildeſt, or moſt fatal form. The hypotheſis, though not productive of equal miſchief in the treatment of the diſeaſe, as a belief of its bilious nature, is neither of uſe in explaining the ſymptoms, nor in the cure; beſides, it gives riſe to ſome ill-founded notions, one of the worſt of which is a belief, that as the fever is of a putrid nature, ſo it muſt be infectious.

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* Lind on the Scurvy.

There is hardly any part of the hiſtory of a diſeaſe, which it is of more conſequence to aſcertain with accuracy, than its being of an infectious nature, or not. Upon this depends

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* See Mr. M'Colme's Diſſections, which are given p. 160.

pends the propriety of the ſteps that ſhould be taken, either to prevent it, or to root it out. It is productive of great miſchief to conſider a diſeaſe as infectious, that really is not ſo; it expoſes ſuch as labour under it to evils and inconveniencies, which greatly aggravate their ſufferings, and often deprive them of the neceſſary aſſiſtance. They are neglected, if not ſhunned; and at the time they require the greateſt care and attention, they are in danger of being deſerted. I have had occaſion to obſerve that the remittent fever, whether with its uſual or more uncommon ſymptoms, with the yellow colour of the eyes and ſkin or without them, was never found to be infectious. The ſtrongeſt proofs of this, in my opinion, were to be met with in private families, where the ſon, the brother, or the huſband, labouring under the worſt fevers, were nurſed with unremitting aſſiduity by the mother, the ſiſter, or the wife, who never left the ſick either by day or by night, yet without being infected. That ſuch near relations ſhould take upon them the office of a nurſe, is matter of the higheſt commendation in a country, the diſeaſes of which require to be watched with greater care and attention, than can be expected from a ſervant. They are under no fears of the fever being infectious, and I never ſaw any reaſon to believe it to be ſo, either in private families, or in the military hoſpitals. There appears not to be any neceſſary connection between infection and putrefaction, even ſuppoſing putrefaction to exiſt in a living body; infectious diſeaſes are not neceſſarily putrid, nor are diſeaſes, ſuppoſed to be the moſt putrid, as the ſcurvy, in the ſmalleſt degree infectious. The operation of a cauſe, generally diffuſed, is often miſtaken for the effects of infection *.

Some have attempted to explain the *phænomena* of fever, by deducing them from one or other of the ſymptoms. The appearances have been ſuppoſed to depend upon the cold fit, and a conſtriction, or ſpaſm, of the blood-veſſels of the ſkin: but in the remittent fever there is often no cold fit, and it happens frequently, that the ſick have the moſt profuſe ſweats without any abatement of the ſymptoms. The uſe of emetics in ſmall doſes, with a view to remove the ſpaſm from the veſſels of the ſkin, by producing ſickneſs, and thence a diſpoſition to perſpire, is evidently liable to the ſame objections, as when had recourſe to for the purpoſe of procuring a diſcharge of bile. Though the intention be different, the effect is the ſame upon a ſtomach highly irritable from the nature of the diſeaſe, and thence eaſily thrown into violent contractions.

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* See note H in the Appendix.

Some have alledged the cauſe of the fever to be ſeated in the ſtomach. It cannot be denied that, in general, that organ ſuffers as early, and in as violent a degree in fevers, as any other in the human body; but it muſt be a vain attempt, to ſeek for the cauſe in any one of the ſymptoms, when every function of the whole frame is deranged.

The voluntary, and involuntary motions are equally affected, as are alſo the ſenſes, and operations of the mind. The muſcular fibre cannot contract with its uſual force, and thence a general loſs of ſtrength; the motion of the heart is too quick, and often irregular; the reſpiration is interrupted with frequent ſighings; the ſtomach loaths food, and is unable to digeſt it; and the bowels are either too ſlow, or irregular in their action. The ſecretions, as of the mucus that lines the mouth, the urine, and the ſweat, all undergo a change.

Viſion is neither clear, nor diſtinct; objects dance before the eyes, and even the impreſſion of light is painful. The ſenſe of hearing is either diſagreeably acute and offended with all kinds of impreſſions, or very dull. The taſte is changed, what was ſweet before is perhaps ſalt, and what was highly grateful is become nauſeous. The ſenſe of ſmelling is equally perverted. The touch no longer judges of the degree of heat with truth, and the diſtreſſing ſymptoms of reſtleſſneſs and conſtant change of poſture, are in part owing to a morbid ſenſibility of every part of the body.

The operations of the mind are no leſs deranged than thoſe of the body. An exertion either of the memory or judgement is fatiguing and painful, and after a ſhort continuance impracticable. Mental impreſſions are indiſtinct, or erroneous. The imagination is wild and confuſed, and paints to itſelf a thouſand ſcenes full of error and deluſion; and that faculty, by which the mind diſtinguiſhes the objects that paſs in the imagination from the real impreſſions, is weakened, ſometimes deſtroyed, and thence delirium, at one time like a fit of madneſs, at another like a waking dream. The ſleep neither brings reſt to the body, nor quiet to the mind; and after a time the whole faculties of the ſoul are overwhelmed by ſtupor, and general inſenſibility.

Such being the *phænomena* of fever, it is impoſſible to derive the ſymptoms from an affection of the brain and nervous ſyſtem; for we often find all the functions of the brain and nerves deranged by local cauſes, as in palſy, mania, and other diſeaſes as much as in fevers, yet the motion of the heart, and operations of the ſtomach, go on as in health, with little variation. Again, the pulſations of the heart are often as quick and irregular as in fever, from diſeaſes of the heart, and ſurrounding parts, as oſſifications of the valves, and dropſies of the thorax; yet the other functions are but little deranged, and there is no fever. The ſame reaſoning will apply to the ſtomach; the functions of which, from local diſeaſes, as ſcirrhus, and cancer, are often as much affected, as in the remittent fever, yet without producing that diſeaſe.

If it ſhould be aſked what explanation can be given of the phænomena of fever, I am ready to acknowledge my own ignorance; yet as it is impoſſible to give due attention to the appearances of ſever, without this queſtion preſenting itſelf to the mind, I will ſtate ſhortly, what would ſeem to be a proper mode of inveſtigating the ſubject.

The cauſe of the remittent fever is evidently the exhalations of wet or marſhy ground, which may be conſidered as a poiſon to the human body [*]. The examination of thoſe exhalations is the firſt ſtep in the inquiry. It is eaſier to point out what are not, than what are the noxious parts of thoſe exhalations. Simple moiſture in the air is perfectly harmleſs, in ſo far certainly as relates to the remittent fever. Marſhy ground is known to produce inflammable air, which is found to be fatal when breathed of a certain ſtrength, but when mixed with common air, it is not known to produce any miſchief [†]. Were inflammable air the cauſe of fevers, they would be frequent in mines, which is not the caſe. Though the cauſe of fevers is not found in the inflammable air, yet the offenſive ſmell of marſhes is in a great meaſure owing to it. Experiments made upon mixtures of mould and ſmall proportions of decaying vegetable and animal matter, kept moiſt, and in a certain temperature, might throw ſome light on the ſubject. The different kinds of elaſtic vapour ariſing from ſuch mixtures, ſhould be carefully examined; and the various ſpecies of *Mucores* that come upon their ſurface, and the inſects that breed in them, ſhould be noted. This inveſtigation muſt be extremely delicate, but conſidering the great progreſs that has lately been made in the examination of all kinds of air, or elaſtic vapour, it is not to be deſpaired of.

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[*] Cullen's Firſt Lines, Vol. I. § lxxxiv, ci.

[†] Philoſ. Tranſ. Vol. LXIX. p. 337.

The next queſtion is, how does the poiſon gain admiſſion into the body? It may be by the lungs in reſpiration; by the abſorbing veſſels of the ſkin; or, by adhering to the *fauces* in reſpiration, it may be ſwallowed with whatever is carried down into the ſtomach.

Late experiments give reaſon to believe, that there is a portion of the air which enters the lungs in inſpiration, abſorbed by the blood paſſing through the blood-veſſels *. This portion would appear to be chiefly, if not altogether, the dephlogiſticated air, which conſtitutes about a fifth part of atmoſpheric air. This air therefore uniting with the blood and entering into the circulation, may carry along with it any poiſon diffuſed through the atmoſphere. The lymphatic veſſels in the lungs may, poſſibly, abſorb any poiſon that is mixed with the air.

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* Prieſtley on Air, Vol. III. Sect. 5.

There are numerous proofs of fevers being occaſioned by the abſorption of poiſons from the ſurface of the body. In mortifications of the lower extremities, the abſorption of a poiſon has been traced by inflamed lymphatics, and conſequent ſwelling of the glands in the groin, which have been followed by a fever of ſome days continuance. An elderly woman, with an old ſore in her leg, was ſubject to fevers, which held her ſeveral days; they were preceded by pain and ſwelling in the groin of the ſide on which the ſore was; and there were red lines obſervable on the ſkin, running from the ſore to the groin, the marks undoubtedly of the poiſon paſſing through the lymphatics. In ſuch caſes there is an evident ſource of the poiſon; but I have met oftener than once with the ſame ſwelling in the groin, followed by a conſiderable, ſometimes a violent degree of fever, and the courſe of the poiſon could be traced by the inflamed lymphatics to the leg, where, however, there was no ſore.

Similar

Similar caſes are, I doubt not, frequent; but the language of the ſick is apt to miſlead the inquirer, for in general they ſay the fever has fallen into the leg, as if the affection of the leg were a conſequence of the fever; whereas, the ſwelling of the glands of the groin will be found to have preceded the fever, and indeed it is commonly the firſt ſymptom to which attention is paid. Some fevers of this kind are very violent, and begin with ſevere rigors, which are followed by great heat, delirium, and other alarming ſymptoms; but what the poiſon is, I have not yet met with any caſe from which I could form a conjecture. Many more facts might be adduced to ſhew, that fevers often ariſe from the abſorption of poiſons from the ſurface of the body; it is probable that the plague is communicated in this way, and that the buboes are not critical, but traces of the route by which the poiſon gets into the circulation.

The loſs of appetite and ſickneſs at ſtomach, which are common in the beginning of fever, may give reaſon to ſuſpect that the cauſe of fever is firſt conveyed into the ſtomach, being mixed with the ſaliva and the mucus that lines the fauces, and ſo ſwallowed; and this ſuſpicion may appear to ſome to be confirmed, by the good effects of ſuch medicines as evacuate the ſtomach and bowels, upon the firſt attack of fever. But it ought to be recollected, that in the inoculated ſmall pox, a febrile diſorder evidently depending on a poiſon entering by abſorption, the firſt ſymptoms are loſs of appetite, and ſickneſs at ſtomach.

The poiſon having got admiſſion into the body, the laws that regulate its operations are next to be inquired into. The violence of it would appear to depend upon two circumſtances, which are found to have great influence upon the operation of many other poiſons; the quantity and virulence of the poiſon; and the body having been more or leſs habituated to it*. The poiſon appears to be ſtrongeſt as it riſes from the ground, and becomes weaker as it is more diffuſed, and mixed with a larger proportion of air. Houſes on the ground are more unhealthy than thoſe that are elevated †. The neighbourhood of marſhes is alſo unhealthy, particularly ſuch places as lie to leeward of them; and as you recede from the marſh there is leſs ſickneſs, till at laſt you get beyond its ſphere of action, and that at no great diſtance. Fort Auguſta is ſeated on a bank of ſand, behind it is an inlet of the ſea, and beyond that a conſiderable extent of marſhy ground. The land wind blows every night from the marſhes towards the fort, and they are not in a direct line three miles diſtant, yet they are not productive of fevers. How much leſs than three miles might be ſufficient to do away the noxious effects of the exhalations, I am not in poſſeſſion of facts to determine. It is probable that the diſtance may be affected by various circumſtances; as the extent of the marſh, or the diſpoſition of the hills in the neighbourhood, which may confine as in a funnel the ſtreams of air, and give them a particular direction.

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* See note I in the Appendix.

† Bontius, Med. Ind. cap. xii.

After the human body has been expoſed to the poiſon, ſometimes a longer, ſometimes a ſhorter period elapſes, before a fever is produced. The men on the watering ſervice are not all taken ill at the ſame time; ſome fall ſick the firſt or ſecond day, and others not till ſeveral days after they have ceaſed to be expoſed to the cauſe of fever, by returning on board of ſhip. The poiſon, it would appear, may lie dormant ſome time in the body, though it is difficult to determine accurately how long. Some have embarked on board of ſhip in good health, and have been ſeized after ten or fourteen days with the remittent fever. Examples in this way have come to my knowledge, of the fever appearing three weeks after ceaſing to be expoſed to the cauſe of it; how much greater the interval may be, I know no facts to determine [*]. We may venture to lay it down as an axiom, that the poiſon will be more or leſs miſchievous, as it is more or leſs concentrated; a property that is not found in what may be called ſpecific poiſons, as that of ſmall pox, the venereal diſeaſe, and others.

The power of habit, in counteracting the effects of the poiſon, is univerſally acknowledged. New-comers are not only more ſubject to the diſeaſe, but in them it is of the worſt kind. A firſt attack is called in common language a *ſeaſoning*. In this reſpect it is like many other poiſons, to which the human body gradually accommodates itſelf. Opium may be ſwallowed in large quantities by thoſe accuſtomed to it. The ſame is true of ardent ſpirits, and of moſt, if not all the ſubſtances that produce intoxication. The negroes, who live in marſhy parts of the country, afford the moſt ſtriking example of the power of habit in reſiſting the poiſon; they are very little ſubject to the fever, and in them it is almoſt always ſlight. In the expedition againſt Fort St. Juan, not one in twenty of the ſoldiers returned, whereas none of the negroes died of fevers. The hiſtory of the Buccaneers furniſhes many ſtriking examples of Europeans becoming ſo habituated to the climate of the Weſt Indies, that they were enabled to bear the greateſt hardſhips and fatigues, without ſuffering from diſeaſe.

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[*] See note K in the Appendix.

Another circumſtance before noticed deſerves to be more particularly inveſtigated, as it renders the poiſon both more certain, and more violent in its effects; that is, being expoſed to it when fatigued by hard labour and long faſting. The poiſon gains admiſſion more readily into the body, and produces immediately the worſt kind of fever. It is in this way that ſoldiers ſuffer ſo much, on actual ſervice, in the Weſt Indies. The few caſes of fever which proved fatal in 24 hours, that occurred to me, were all contracted in a ſimilar manner. A ſoldier taken ill on a march, and under the neceſſity of walking five or ſix miles, has ſcarcely a chance of recovering; and if he do not expire on the way, ſeldom ſurvives the completion of the march many hours. In a fatigued and exhauſted ſtate of the body, the veſſels on the ſurface both of the ſkin and lungs, probably come to be in an inhaling ſtate, and thus give freer admiſſion to the poiſon; and the quickened circulation of the blood conveys it more ſpeedily, and more intimately, to the minuteſt veſſels of the body.

The moſt important queſtion, after the poiſon has gained admiſſion into the human body, is; How does it produce the ſymptoms of the fever? Our ignorance of the animal economy abſolutely precludes us, from giving any adequate anſwer to this queſtion. But when we conſider, that every function of the human frame is deranged; that the blood is often in a diſſolved ſtate, and that there is a total loſs of ſtrength, we may conclude, that the poiſon affects the principles of life in every part of the body; and in fact we find that parts of the body do actually mortify, and die.

What the principles of life are, we cannot yet form a conjecture, and to puſh our inquiries further on that ſide, would afford no ſatisfaction.

The illuſtrations, that apply beſt to our ſubject, are borrowed from the operations of poiſons. Sickneſs and vomiting are the firſt effects of moſt poiſons, animal as well as vegetable, and alſo of morbid poiſons [*], and are likewiſe common at the commencement of fever. It is true ſome poiſons, if ſufficiently concentrated, as the laurel-water, poiſon of the Ticunas, and others, produce convulſions, and almoſt inſtant death [†]: analogous to this, the remittent fever often begins in children with fits, and ſometimes alſo in adults. The blood comes to be in a diſſolved ſtate from many poiſons, as that of the viper; and the ſame poiſon is known to produce a jaundice, preceded by great loſs of ſtrength, and ſometimes fainting fits. Here then are ſeveral of the ſymptoms of the worſt kind of remittent fever, particularly the jaundice. I do not know of any inſtance of the body having been examined after death, occaſioned by the bite of a ſerpent; but when the bodies of thoſe, who have died of the yellow fever, have been opened, if there were any morbid appearances, for often there were none, they conſiſted chiefly in the internal coats of the ſtomach and duodenum being in an inflamed ſtate. The gall in the bladder and ducts is generally found ropy and viſcid, as if it had ſtagnated for ſome time, though no cauſe of obſtruction appear in the duct. It is probable that the inflammation in the coats of the duodenum and ſtomach, and the violent contractions they ſuffer from repeated vomiting and ſtraining, may produce a ſpaſm of the gall ducts, ſufficient to interrupt the courſe of the bile*. That the *ductus communis* poſſeſſes naturally a power of contraction in an healthy ſtate cannot be doubted, for, without ſuch a contraction in ſome part of it, the bile could never regurgitate ſo, as to fill the gall-bladder. That jaundice may proceed from other cauſes, beſides a ſtoppage to the flow of the bile by *calculi* or mechanical preſſure, muſt be allowed, as an examination of the body after death has often ſhewn no ſuch cauſes to exiſt *. In the body of a perſon who died of pulmonary conſumption, I had lately occaſion to obſerve ſome things not altogether foreign to the preſent ſubject. A few days before death, to the common ſymptoms of the diſeaſe, was ſuperadded a jaundice. The lungs were found diſeaſed in the uſual manner; there were adheſions to the pleura, tubercles, indurations, and ſuppurations in their ſubſtance. In the abdomen there were marks of ſuperficial inflammation all over the liver, and the lower ſurface of it was united to the ſtomach by adheſions. The gall-bladder was full, but no bile could be ſqueezed out of it. On laying the *ductus communis* open from the *duodenum*, it was found filled with bile of a brown colour, and of a thick and ropy conſiſtence, as were alſo the *ductus hepatici*. Part of the *ductus cyſticus* was laid open, and the gall-bladder was preſſed with conſiderable force, but ſtill no bile flowed. Through a blow-pipe introduced into the duct, the air at laſt with ſome difficulty was forced into the gall-bladder, after which by preſſing again, a coagulum of bile was ſqueezed out, and what followed was ropy and black, like melaſſes. On laying the duct open all the way to the bladder, there appeared no other obſtruction to the bile than the coagulum, which, as well as the thick and ropy ſtate of that ſecretion, appear rather to have been the effects of ſtagnation, than a cauſe of obſtruction in the firſt inſtance. Did the inflammation in the neighbourhood of the ducts, and perhaps extending to them, excite ſuch contractions in them as obſtructed the bile, in the ſame way that a ſuppreſſion of urine, is ſometimes a conſequence of inflammation, in the urinary paſſages?

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[*] According to Mr. Hunter's diſtinction. Vid. Treat. Ven. Diſ. p. 9.

[†] Fontana, ſur les Poiſons, Vol. II. p. 82, 125, 137.

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* Fontana, ſur les Poiſons, Vol. I. part 5. ch. 13. p. 69.

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* Morgagni, de Sed. et Cauſ. Morb. Ep. 53. § 16, 17. Ep. 37. § 10.—Sir John Pringle, Diſ. of Army, Appendix, p. cxix. edit. 7th.

The cauſe of the jaundice, in the remittent fever, deſerves to be farther inveſtigated in the dead body, and I have to regret that I did not attend to it more while in Jamaica. The following letter, containing an account of the diſſections of 23 bodies, was written to the late Sir John Pringle by Mr. John M'Colme, a man of veracity and obſervation, who ſerved as a regimental ſurgeon in the Weſt Indies, in the years 1741 and 1742.

" ANATOMICAL FACTS *from the* " *opened Bodies of* 23 *Officers and Soldiers,* " *who died of the Bilious, or Yellow Fever,* " *in the Weſt Indies.*

" IN all the caſes the liver was changed " in part (and ſometimes almoſt the whole) " to be more pale, and hard, than natural; " and in ſuch parts there was a leſs propor- " tion of blood, than in thoſe of a more na- " tural colour.

" In ſuch as greatly differed in colour and " hardneſs, there were found obſtructions in " the larger branches of the vena porta re- " ſembling what are called *polypi*.

" The bile in the gall-bladder, of a deeper " colour, much thicker and more viſcous, " than common; ſmall in quantity, never " exceeding an ounce; oftener from half an " ounce to ſix drachms.

" The ſpleen larger, ſofter, and whiter, " than common.

" The internal part of the ſtomach and " duodenum ſometimes reddiſh, or yellow, " but often blackiſh; the tunica villoſa very

" eaſily ſeparating, even with the touch; the
" other guts much in the ſame ſtate: but in
" general the two firſt moſt affected.

" In the ſtomach often a thick mucus,
" with the ſame black ſtuff that is thrown
" up by vomit: if the villous coat is not
" much affected, the mucus prevails; but if
" otherwiſe the *black vomit*.

" Farther down the guts the black ſtuff is
" thicker, and more viſcid, almoſt reſembling
" tar; and in the great guts it is often mixed
" with clotted blood.

" The cellular and other membranes much
" diſtended with blood; the tendinous part
" of the diaphragm and pleura look as if
" injected.

" In one perſon who had been troubled
" with a violent hickup, there was an ulcer
" on the tendinous part of the diaphragm,
" that diſcharged ſanies into the thorax.

" The lungs were often blackiſh next the
" pleura, and interſperſed in many places with
" large livid ſpots.

" In the right ventricle of the heart, *ſinus*
" *venoſus*, and *vena cava*, there was leſs blood
" than common.

" The urine in the bladder commonly
" yellow.

" One thing was remarkable, that not-
" withſtanding the bodies both before, and
" after death, had a very diſagreeable ſtench;
" yet upon opening the abdomen and the
" guts, there was not near ſo cadaverous or
" fœtid a ſmell, as there is generally in
" Europe. They were indeed opened ſoon
" after death; and generally had been purged
" during their illneſs.

" It is worth while to obſerve, that two
" bodies were alſo opened; each of which
" formerly had the bilious fever; but died
" ſome time after from other cauſes. None
" of them had obſtructions in the liver, and
" the bile in the gall-bladder was larger in
" quantity, and more fluid than common.

" All theſe bodies were opened by the di-
" rection of Dr. Robert Dalrymple, phyſician
" to the army, in the years 1741, 1742. At
" the opening of many of them I was preſent;
" the reſt the doctor told me were ſimilar to
" what I ſaw."

The morbid appearances mentioned in the letter, are nearly all referable to two cauſes;
the

the abſorption of the bile into the general maſs of circulating fluids, and more or leſs of a diſſolution of the blood. The pale colour of the liver and ſpleen, depended on the bile that had been abſorbed, and mixed with the blood; under which circumſtances it tinges thoſe *viſcera*, and almoſt every part of the body, of a yellow colour, as is ſeen in common caſes of jaundice. The black matter, found in the ſtomach and bowels, appears evidently to have been the blood, that had oozed through the veſſels; and this, as well as the livid ſpots upon the lungs, are proofs of the diſſolved ſtate of the blood. Similar livid ſpots are often found upon the lungs of animals that die of poiſons, and proceed from the blood being in a diſſolved ſtate *.

Though a compariſon of the effects of other poiſons with thoſe of the exhalations of marſhes, promiſes to throw more light on the ſubject of the remittent fever, than any other mode of inveſtigation that preſents itſelf, yet the inquiry cannot be puſhed a great way. There is ſomething uncommonly ſubtle and abſtruſe in the operations of poiſons, as may be deduced from this, that of the various poiſons of which we have daily experience, there is none of whoſe effects we can give any good explanation. Moſt of the morbid poiſons are confined to one ſpecies of animals, yet we can ſee nothing in the poiſon, or in the ſpecies, to account for this. The ſmall-pox, meaſles, plague, and many other diſeaſes affect the human ſpecies only, though no reaſon appears why it ſhould be ſo; and any explanation of thoſe diſeaſes, whether derived from fermentation, putrefaction, or a peculiar action of veſſels, contains nothing to inſtruct us, why they ſhould not affect other animals as well as man, which is in itſelf a full proof how nugatory ſuch explanations are. Putrefaction is the ſame nearly in all animal matter; and we have not yet learnt from phyſiology or anatomy, any peculiar properties or actions that our blood-veſſels poſſeſs, which are not to be found in many other animals. But although the inveſtigation of the operation of poiſons on animal bodies be a ſubject of extreme difficulty, it is not to be deſpaired of; nor are we, in any caſe, to ſet limits and boundaries to the advancement of human knowledge, by experiment and obſervation.

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* Vid. Fontana, ſur les Poiſons, Vol. I. part. 3. chap. 3.

SECT. IV. *Of Intermittent Fevers.*

INTERMITTENT fevers, as quotidians, tertians, quartans, and all the variations of them uſually mentioned by writers, occur frequently in Jamaica. The fevers that prevail moſt, during the more healthy part of the year, are intermittents; whereas, during the rains, and for ſome time after, they are chiefly remittents: as if both depended upon the ſame cauſe, acting at different times with more or leſs violence. The almoſt endleſs varieties of intermittent fevers, deſcribed by the ancients, have ceaſed in a great meaſure to be the objects of attention, ſince the Peruvian bark has been diſcovered, to be the moſt efficacious remedy againſt them all, whatever type they aſſume. While it was believed, that the various forms of the diſeaſe required peculiar modes of treatment, it was deemed a matter of the laſt conſequence to diſtinguiſh them rightly.

In the hiſtory of intermittent fevers in Jamaica, there is little to be obſerved that is peculiar to the climate. The cold fit is generally leſs ſevere than in more northern latitudes, and during its continuance it is not uncommon for the ſick, to expoſe themſelves to the direct rays of the ſun, taking in this an example from the negroes, who thereby more effectually relieve the painful ſenſations of cold, than by ſitting over the fire, or covering the body with a load of bed-clothes, as practiſed in colder countries.

The quotidian is the moſt dangerous form of the diſeaſe, and is more or leſs ſo, as it approaches to, or recedes from, a remittent fever. The tertian is leſs dangerous, and the quartan leaſt of all; though there, as well as in other countries, it is extremely obſtinate and difficult of cure.

SECT. V. *Of the Cure of Intermittent Fevers.*

WHEN the intermiſſions were compleat, the bark was given directly, without any previous evacuations, in order to cleanſe the ſtomach and bowels, which is to be conſidered as rather recurring to an old, than giving into a new practice *. There was no inconvenience aroſe from omitting the vomiting and purging, uſually made to precede the bark; on the contrary it was ſo much time gained. The bark was given in the doſe of one or two drachms in wine, or any other vehicle that was more agreeable to the ſick, and repeated every two hours, or oftener, according to the urgency of the caſe, and the ſtate of the ſtomach.

After the progreſs of the diſeaſe was ſtopped, it was ſtill proper to give a doſe of the bark twice or thrice a day, for five or ſix days, in order to prevent a relapſe. If the bark rendered the body coſtive, half an ounce of the tincture of ſena, or of rhubarb, or an aloetic pill was given at bed-time; or a few grains of rhubarb were added to one or more doſes of the bark.

Although the bark be not leſs efficacious in the cure of intermittents in Jamaica, than in other parts of the world, yet it happened that there were caſes which did not yield to it, though given liberally, and for a length of time.

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* See Sydenham, Proceſſus integri, de Feb. Intermitt.

time. In ſuch caſes various means were tried, and to ſome of them the fever commonly gave way; although it was difficult to determine to which a preference was due, as ſometimes one appeared more ſucceſsful, ſometimes another. Chamomile flowers reduced to a fine powder, and given in the doſe of half a drachm, or even a drachm, and repeated every three hours, often ſtopt the fever after the bark had failed. A warm purgative, as ſix drachms of the tincture of rhubarb, and as much of the tincture of ſena, was ſometimes given ſix or ſeven hours before the fit, and the bark as uſual, after it was over. This as well as the chamomile flowers ſometimes failed, and ſometimes ſucceeded.

The cold bath, in the river at Spaniſh Town, was effectual in ſubduing old intermittents in many inſtances. The bath was taken in the morning, when the temperature of the river might be from 75° to 80°.

Sal ammoniac, or alum, were ſometimes added to the bark, and the former was given in ſome inſtances by itſelf, but their power did not appear great, though they ſtopped the fever in ſome caſes.

For ſome years paſt, intermittents have been more frequent in, and about London, than formerly. Since my return from Jamaica, I have often joined mercurials * to the bark in the treatment of ſuch fevers, when they have proved obſtinate, and with good ſucceſs. The preparation made uſe of was *Calomel*, which was ſometimes given in the quantity of 3 or 4 grains along with 15 or 20 grains of jalap, ſo as to prove purgative; but more commonly in ſmaller doſes, and by itſelf at bed-time, ſo as to keep the body only moderately open. For this purpoſe one or two grains every night, or every other night according to circumſtances, were generally ſufficient, while the bark was given in the uſual way, during the intermiſſions of the fever. The mercurial gave new efficacy to the bark, and this treatment often proved ſucceſsful. It is probable a ſimilar practice might ſucceed in the Weſt Indies, though I have no experience of it †.

Towards the end of the war ſome red bark was ſent to Jamaica, which given in the ſame doſe with the common bark affected the bowels, producing ſickneſs and vomiting, or griping, purging and flatulence. The doſe was therefore reſtricted to half a drachm, which was repeated every three hours, and cured many intermittents that had reſiſted the common bark. The great tendency which it had to affect the ſtomach and bowels, rendered it leſs proper than the common bark in the remittent fever, and on that account, after a few trials, it was laid aſide in that ſpecies of the diſeaſe. Whether it would have been more efficacious in curing intermittents, if given in the firſt inſtance, than common bark, is a queſtion that I had not an opportunity of bringing to a fair deciſion; for though it often cured fevers that reſiſted the common bark, yet nearly as much might be ſaid of the chamomile flowers, though that would not be good ground for ſuppoſing the latter medicine a better than the former. If the red bark, and the common bark, were given in the firſt inſtance in a number of intermittents, that would doubtleſs be deemed the beſt medicine, which cured the greateſt proportion of the ſick. In order to form a juſt judgment, the number of caſes ought to be conſiderable, certainly not leſs than ten for each of the medicines. Simple as this experiment is, I do not know that it has yet been tried. In the mean time we may ſafely conclude, that we are in poſſeſſion of a valuable medicine, which will often ſucceed, after the common bark has failed.

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* Vid. Med. Tranſ. Vol. III.

† See note L in the Appendix.

It has been already obſerved, that the remittent fever, after repeated attacks, often produces dropſy, or ſwellings of the liver or ſpleen, and frequently a complication of theſe diſorders; the ſame thing holds true of intermittents. Thoſe labouring under ſuch accumulated diſtempers, are hardly to be reſtored by any means that can be employed, while they remain upon the iſland and continue expoſed to the ſame noxious cauſes, which originally affected their health. The conſtitution, broken down in every part, can only be repaired by haſtening to a colder climate, and a more ſalubrious air; and even theſe are often deferred till it be too late. The air of the mountains, and a frequent change of it in travelling by eaſy journeys, together with bitters to ſtrengthen the ſtomach, and occaſionally ſmall doſes of mercurials, will often procure a temporary amendment. The mercurial given for the ſwellings of the liver * or ſpleen, was the mercurius dulcis, which was exhibited in ſmall doſes. In caſes of dropſy, quickſilver, rubbed down with an equal quantity of honey or conſerve of hips, was given; the doſe was from five to ten grains of the maſs, to which half a grain, or even a whole grain of the dried ſquills was added, to render it diuretic; and it was repeated every other night for ten days, or a longer or ſhorter time, according to circumſtances. If advantage, however, were not taken of any favourable change in the health, from the means juſt mentioned, and the ſick ſent to a more healthy climate, the diſeaſe generally recurred in a ſhort time with greater violence, and ſoon proved fatal.

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* See note M in the Appendix.

CHAP. IV.

Of the DYSENTERY.

SECT. I. *Of the Symptoms of the Dyſentery.*

IN treating of the dyſentery, I have confined myſelf to ſuch obſervations, as more particularly apply to the climate, or have not hitherto been made; not judging it neceſſary to enter minutely either into the hiſtory of the diſeaſe, or the method of cure, which have been ſo fully treated by much abler hands.

The dyſentery, as it appears in the iſland of Jamaica, is the ſame diſeaſe that is ſo well deſcribed by Sydenham, Sir John Pringle, Sir George Baker, and others; and is not diſtinguiſhed by any peculiar ſymptoms from the dyſentery, that was epidemic in London, in the ſummer and autumn of the years 1779, and 1780.

There ſubſiſts an intimate connection between the remittent fever and this diſeaſe, in Jamaica; the one frequently changes into the other, and the two diſeaſes are often complicated with various degrees of violence. In ſome caſes the dyſentery ends in a fever, though it happens much oftener that the fever terminates in a dyſentery, eſpecially among the common ſoldiers.

In ſome ſeaſons the dyſentery is much more frequent than in others, which was the caſe in 1782; the cauſe of this is not ſo obvious. It was hotter than common in the month of June by three or four degrees, the thermometer riſing many days to 90°, an unuſual heat in that climate. An higher degree of heat than common, in our ſummers in England, has been obſerved to be productive of dyſenteries, as was the caſe in the ſummers above mentioned; but, in Jamaica, the cooleſt month in the year is at leaſt 12° hotter, than the hotteſt month in our ſummers: if the cauſe therefore depended upon any abſolute degree of heat, the dyſentery ſhould prevail all the year round. How far it may ariſe from a comparative increaſe merely in the heat, though there is ſome ground to ſuſpect it may be ſo, I have not ſufficient experience to determine.

There are various degrees of violence in the diſeaſe, from ſlight gripings with frequent ſlimy ſtools, to the moſt excruciating pains in the bowels, inceſſant ſtraining, profuſe diſcharge of blood, great fever, and ſudden proſtration of ſtrength. Between theſe extremes are numerous intermediate degrees, and though the ſlighter caſes may be called by the name of diarrhœa, yet there are no ſpecific marks of diſtinction; they run into one another by an inſenſible gradation, and therefore ſhould not be diſtinguiſhed by different names*.

There are ſome of the quarters, ſuch as Fort Auguſta, and Port Royal, ſubject to a mild kind of dyſentery, eſpecially when the ſoldiers firſt take poſſeſſion of them. It is probably owing to the water in both places, for as they are ſituated upon ſand-banks nearly ſurrounded by the ſea, they have no freſh water but what is brought to them, commonly from the mouth of the Spaniſh Town river. This water becomes extremely putrid, eſpecially if put in caſks that formerly contained rum, and in ſuch a ſtate is undoubtedly hurtful to the bowels. There are other circumſtances in the management of the water, that deſerve to be noticed; it is ſometimes kept in ciſterns, in which millions of inſects, particularly muſquitoes, breed; the negroes likewiſe employed in taking up the water, do not always proceed far enough from the mouth of the river, to get clear of all admixture of ſalt water, ſo that it is ſometimes brackiſh. That ſuch water ſhould produce complaints of the bowels, will not appear ſurpriſing, and it is probably the ſole cauſe of them *. It were to be wiſhed that Fort Auguſta, and Port Royal were ſupplied with good water, ſuch as that of the watering-place for the royal navy, and that it were kept in proper caſks: for, by theſe means it would be aſcertained beyond a doubt, what ſhare the water had in producing the flux.

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* The antients apply the terms Dyſentery, Diarrhœa, Lienteria, Teneſmus, &c. to the ſeveral ſtages or ſymptoms of this diſeaſe, and conſider them as ſeparate and diſtinct diſtempers. Some of the ſymptoms of fever they have alſo treated as diſtinct diſeaſes, as phrenitis, and lethargus, which are the delirious and comatoſe ſtages of fever. Vid. Cœl. Aurelian.

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* Bontius de Med. Ind. dialog. 3$^{\text{tio}}$.

A ſymptom that frequently occurs in the diſeaſe, and is not taken notice of by the authors above quoted, is an immediate call to go to ſtool, upon ſwallowing any thing either ſolid or liquid, accompanied with a feeling, as if what was juſt ſwallowed, were running through the bowels. This ſenſation is often ſo ſtrong, that the ſick imagine that the food they have taken has really paſſed through them, and are not convinced of the contrary, till they find that the diſcharge has been ſlime or mucus, without any reſemblance to what they had ſwallowed. This ſymptom ſhews great irritability in the bowels, by which a motion excited in the ſtomach, is propagated almoſt directly to the anus.

The dyſentery did not appear to be infectious in the hoſpitals in Jamaica, nor in the epidemic that prevailed in London in the years 1779 and 1780. I am far from meaning to ſay, that the dyſentery is never infectious; but there is ſome difficulty in determining a queſtion of this kind, for unleſs the proofs of infection are clear and decided, they may be eaſily confounded with the effects of a cauſe, that is generally diffuſed, and operating upon all more or leſs, ſuch as the cauſe of dyſentery muſt be.

SECT. II. *Of the Cure of the Dyſentery.*

THE dyſentery, like the fever, requires to be taken care of early, for the means that will either overcome, or greatly mitigate the diſeaſe at the beginning, will not be able to make any impreſſion upon it, after it has continued ſome time. The firſt medicine that was given was a purgative. The kind of purgative moſt commonly made uſe of was the bitter purging ſalt *, or Glauber's ſalt †, ſometimes with manna, and always with one or two drops of the oil of peppermint, added to the ſolution of the ſalt. An ounce of ſalt, and half that quantity of manna, diſſolved in half a pint of water, with the addition of the oil of peppermint, were divided into two parts, which were given with an interval of half an hour, or a whole hour between them, according to the ſtate of the ſtomach. The operation of the phyſic is promoted by drinking plentifully of thin water-gruel, whey, chicken water, tea, or any diluting liquor that is moſt agreeable to the ſick. In this way ſeveral copious ſtools are procured, whereby the griping and other ſymptoms are greatly relieved. After a favourable operation of the phyſic, an opiate, from fifteen to twenty drops of the tinctura thebaica, was given at bed-time. The purgative in almoſt all caſes procures a truce with the diſeaſe, and the opiate prolongs it.

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* Magneſia Vitriolata, Pharm. Lond. 1788.

† Natron Vitriolatum, Pharm. Lond. 1788.

It is in ſlight caſes only, and at the commencement of the diſeaſe, that one doſe of phyſic is ſufficient to ſtop its progreſs; a reſpite merely is in general all that is obtained. When the ſymptoms recur, the ſame medicines are to be repeated. The ſick are not weakened by the operation of the purgatives, at leaſt as long as they procure relief from the griping pain. When the diſeaſe is violent however, and the purgatives have been frequently repeated, and the ſymptoms ſtill recur at the ſame time that the ſtrength is greatly impaired, there is a period beyond which purgatives cannot be longer given with advantage. In this ſituation I have repeatedly made uſe of the following medicine with great benefit; two table ſpoonfuls of a ſtrong de-

coction

coction or infuſion of the bark, and the ſame quantity of ſtrong chamomile tea, were made into a draught, to which as much rhubarb was added, as would procure two or three copious diſcharges from the bowels in the twenty-four hours. The quantity of rhubarb uſually added was about five grains, the draughts were given every three hours, and the rhubarb was either increaſed, diminiſhed, or altogether omitted according to its operation. It may deſerve to be noticed, that the ſick can readily diſtinguiſh the motions proceeding from the diſeaſe, from thoſe produced by a purgative medicine. I firſt gave this medicine in caſes where there was a conſiderable degree of fever, together with the dyſenteric ſymptoms; but I have ſince given it, and with good effect, when there has been little or no fever, but the ſtrength of the patient has been too much reduced to bear purgatives*.

The griping pains of the bowels, which are often excruciating, are relieved by fomentations applied to the abdomen, and ſtill more effectually by bliſters on the ſame part.

It is ſometimes impoſſible to begin the cure with a purgative, owing to great ſickneſs at ſtomach and vomiting. Under ſuch circumſtances, the evacuation of the ſtomach is promoted by giving warm water, or weak chamomile tea; and nothing more powerfully emetic is adminiſtered. As ſoon as the ſtomach is quieted, one or two drachms of the purging ſalts are given at a time, and repeated every hour, till they have had the deſired effect. The treatment is afterwards the ſame as mentioned above.

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* See note N in the Appendix.

After getting over the firſt attack, the chronic ſtage of the diſeaſe often follows. This conſiſts of frequent returns of the griping, ſtraining, and purging, with ſhort intervals of eaſe. The intervals ſeldom exceed one or two days; the ſtrength and fleſh waſte, hectic fever comes on, and more periſh in this ſtage of the diſorder than by the firſt attack. The remedies here are nearly the ſame as thoſe above mentioned; nothing procures equal relief with a medicine gently opening, and the opiate muſt now be given more freely; the uſe of it indeed can hardly be diſpenſed with for one night. It may appear liable to objection to give an opening medicine at a period of the diſeaſe, which is ſuppoſed to depend upon a laxity of the bowels, and to require aſtringents. That the chronic ſtage of the diſeaſe may ſometimes proceed from a mere laxity, I have no doubt; but ſuch caſes are neither very frequent, nor, I apprehend, dangerous. Nine out of ten, at leaſt, of the chronic dyſenteries depend upon obſtructions, and a diſeaſed ſtate of the bowels, as the diſſection of the dead bodies demonſtrates. The morbid appearances of the bowels, after death, throw great light on the diſeaſe, I ſhall therefore mention them ſhortly.

Upon a firſt view the bowels, particularly the colon, appear irregularly contracted, and redder than natural at the contracted parts. Upon a nearer inſpection, by cutting out portions of the gut and examining the internal coats, the appearances of diſeaſe become more evident. There are to be ſeen ſmall tubercles, like puſtules, ſometimes in a ſmaller, ſometimes in a greater number; and they are to be found in different ſtages, ſo that their progreſs can only be collected from ſeveral obſervations combined. The ſame ſubject will frequently furniſh, in different portions of the gut, examples of the ſeveral ſtages. Their progreſs appears to be nearly as follows;

there is firſt a ſmall round tubercle of a reddiſh colour, and not more than one tenth of an inch in diameter; it increaſes gradually till it be near a quarter of an inch in diameter, and becomes paler as it grows larger. In this ſtage there appears a ſmall crack on the top with a ſlight depreſſion, which gradually increaſe; and on examining the contents of the little tumour, I have generally found them to be a cheeſe-like ſubſtance. The puſtule, for though it contain no *pus*, I do not know any name more expreſſive of its appearance, is ſeated under the villous coat, between that and the muſcular coat. As the opening enlarges, the edges become prominent, and the baſe grows rough and ſcabrous, from which matter oozes out, that is ſometimes tinged with blood. Such is the progreſs of one, but they are often in cluſters, and become confluent, ſo as to form a rough unequal ulcerated ſurface, with an hard and thickened baſe. Sometime, they appear like a ſmall eating ulcer in the gut, in which the prominence of the edges give an appearance of a loſs of ſubſtance, or as if the villous coat were intirely removed.

Theſe morbid appearances probably take place more or leſs, in all caſes of epidemic dyſentery. They were firſt taken notice of, as far as I know, by Mr. Hewſon*, and afterwards by Dr. Woolaſton†. Whether they are conſtant and invariable, remains to be determined by future obſervations: they were found in all the dyſenteric ſubjects that I have examined, but that number is not conſiderable, and we are not warranted to conclude, that there may not be various morbid appearances, peculiar to the diſeaſe under different circumſtances. SIR JOHN PRINGLE has indeed mentioned mortifications, gangrene, and abraſions of the villous coat, none of which I have ever ſeen; and there is reaſon to ſuſpect, that the black colour ariſing from extravaſated blood has been taken for mortification, or beginning gangrene, which I the more readily mention, that the learned author acquainted me in his lifetime, that he put but little confidence in any of the diſſections of dyſenteric patients, which were made in the military hoſpitals, as the bowels were not inſpected minutely. Sentiments, not much

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[*] Vid. Pringle, Diſ. of Army, ed. 7th. p. 243. p. iii. ch. 6. § 2.

[‡] Baker's Libellus de Cat. & Dyſ. ſub finem.

different from theſe, are to be found in his book *. The tubercles are moſt frequently found in the great guts, but they are alſo ſometimes to be met with in the *ileum*; and there is an appearance of more or leſs of inflammation in their neighbourhood. It is perhaps unneceſſary to mention, that the tubercles with their various ſtages cannot be obſerved without waſhing off the mucus, blood, and matter, that cover the inner ſurface of the gut.

Several of the ſymptoms may be illuſtrated from the morbid ſtate of the parts, as they appear upon diſſection. The ſmall grains of cheeſe-like matter often voided by the ſick, moſt probably proceed from the tubercles upon their firſt opening; the thin watery ſtools, with a mixture of blood, like the *lotura carnium*, ariſe from the ſerum diſcharged from the numerous little ulcers; and if the blood be in a diſſolved ſtate, or the inflammation great, much red blood may ooze out, and give the evacuations the appearance of conſiſting almoſt entirely of blood, an occurrence not unfrequent in the worſt, and moſt fatal kind of Dyſentery. When the diſeaſe is violent, it is probable that the whole ſurface of the gut may be covered with tubercles; in which caſe great inflammation joined to violent ſpaſms and contractions of the bowels, excited by ſo many irritating cauſes, muſt ſoon prove fatal. Should however the ſick have ſtrength to bear up againſt the firſt attack of the diſeaſe, they will often have to ſtruggle againſt the evils ariſing from numerous ſmall ulcers in the bowels, the conſequences of the tubercles, which bring on what has been called the chronic ſtage.

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* Page 250, 7th ed.

The tubercles and conſequent ſmall ulcers, when in cluſters, occaſion a conſiderable contraction of the paſſage, not ſo much by their projecting into the cavity, as by the ſpaſms they excite in the muſcular coats of the gut. The diminution of the canal obſtructs in part the paſſage of the contents of the bowels, which accumulating muſt at laſt be propelled by greater efforts, and when forced through the contracted parts they occaſion pain, griping, and frequent calls to go to ſtool, which recur from time to time, and characteriſe the chronic ſtage of the diſeaſe. It is alſo accompanied in general by an hectic fever, proceeding from an abſorption of matter from tubercles or little ulcers; for it deſerves to be remarked, that the glands in that part of the meſentery, which correſponds with the diſeaſed gut, are not in a ſound ſtate, but much enlarged and of a ſofter texture than natural.

In the chronic ſtage, laxatives rather than purgatives are to be uſed, as the ſick have not ſtrength to bear a ſtrong medicine, though they require the paſſage to be kept open. Two or three drachms of the purging ſalts will often have the deſired effect, or a few grains of rhubarb, or a ſpoonful of the *oleum ricini*. The opiate muſt be repeated after their operation, and indeed it will commonly be neceſſary to give it every night. A light nouriſhing diet, conſiſting chiefly of milk, broths, and gruels, contributes to the cure.

When the ſtools are frequent and copious, and without griping or pain, aſtringents may be uſed with advantage; but ſuch caſes are not very numerous. The extract of the *lignum Campechenſe*, is a good aſtringent in ſuch caſes, as are alſo the *cortex granati*, and *terra Japonica* *. One of theſe will ſometimes ſucceed after another has failed, though I have not learned what the particular caſes are to which they are peculiarly adapted. I have generally made trial of them in the order in which they are mentioned.

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* More properly *catechu*. Pharm, Lond. 1788.

If the diſeaſe terminate in a *teneſmus*, or if that ſymptom prove troubleſome, it is often entirely removed, and always greatly relieved, by an anodyne clyſter conſiſting of thirty or forty drops of the tinctura thebaica in three or four ounces of linſeed tea, or a thin jelly of ſtarch. SYDENHAM leaves this ſymptom to itſelf, though it is often extremely troubleſome.

I ſhall conclude the ſubject of dyſentery, with ſome obſervations on the remedies uſually employed againſt that diſeaſe.

Blood-letting has been ſtrongly recommended by ſome, and condemned by others. The appearance of inflammation in the bowels on diſſection, would ſeem to ſhew the propriety of that evacuation. Yet it muſt be allowed that there may be an inflammation, that is, redneſs, ſwelling, and pain in a part, for which it would be highly improper to let blood, as is the caſe in all eryſipelatous inflammations. The queſtion, however, can only be determined by experience; and all that I have learned on the ſubject amounts to this, that in ſlighter caſes, or when the diſeaſe is treated early, purgatives have proved ſo effectual, that I have never had recourſe to bleeding: and when the diſeaſe has been more violent, the ſtrength of the patient has been ſo much reduced of a ſudden, that I have not dared to make uſe of that evacuation. Poſſibly there may be circumſtances under which it would not only be ſafe but highly advantageous, and it were to be wiſhed theſe were accurately aſcertained.

Vomits are ſtrongly recommended in this diſeaſe, and it has been common to give them as the firſt ſtep in the cure. The ſick are generally relieved by them, but the benefit is not ſo great as that derived from a purgative, which is both more eaſy and more effectual in its operation. The ſickneſs produced by an emetic is often very diſtreſſing, and it is moſt beneficial when it proves purgative. Upon theſe grounds therefore recourſe was had in the firſt inſtance to the purgative, as the more certain and ſpeedy means of procuring relief.

There are various purgatives recommended by different authors. The bitter purging ſalt,

ſalt [*], or Glauber's ſalt [†], as mentioned before, were found the beſt. They operated eaſily, ſpeedily, and effectually. It is probable there is nothing ſpecific in any purgative, and that they are more or leſs beneficial, as they poſſeſs in a greater or leſs degree, the properties juſt mentioned. Rhubarb and calomel [‡], infuſion of ſena, caſtor oil, ſoluble tartar [‖], or any other purgative, may be given that experience has ſhewn to agree with particular conſtitutions.

There is ſcarcely any part of the practice concerning which authors are more divided, than in the uſe of opiates againſt the dyſentery. Sydenham in many caſes is diſpoſed to truſt the cure entirely to them, while others of almoſt equal authority, condemn them univerſally in this diſeaſe. Sir John Pringle recommends them ſtrongly, with this precaution, that they ſhould not be given till a free evacuation has been procured by a purgative. In his manner of treating the diſeaſe, an opiate cannot be given till the end of the ſecond day, as the firſt is employed in giving an emetic. In the method recommended above, an opiate is given in ten or twelve hours, or as ſoon as the purgative has operated freely. If the griping and other ſymptoms are relieved by the phyſic, an opiate never fails to do good by prolonging the truce thus obtained with the diſeaſe; but if no relief be obtained, which however never happens except in the very worſt caſes, the opiate does little or no good. It is objected that the truce obtained by the opiate is fallacious, and of ſhort continuance. That the diſeaſe commonly recurs, except in the ſlighter caſes, muſt be admitted, but this cannot be laid to the charge of the opiate, which conſiderably retards its return: and if any objection is to be made to the uſe of this medicine, it ſhould be that it is not able ſo completely to ſubdue the diſeaſe, that it ſhall not return. But although neither that, nor any other medicine we are yet acquainted with, poſſeſs a virtue ſo much to be wiſhed for, it is ſtill of great importance, in a diſeaſe that ſo ſeverely harraſſes and debilitates the ſick, to procure even a temporary relief to their ſufferings, whereby they are better enabled to bear the operation of medicines afterwards neceſſary; and to ſupport themſelves againſt the diſeaſe.

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[*] Magneſia vitriolata. Pharm. Lond. 1788.

[†] Natron vitriolatum. Pharm. Lond. 1788.

[‡] See note O in the Appendix.

[‖] Kali tartariſatum. Pharm. Lond. 1788.

Opiates were ſometimes combined with an emetic or purgative medicine, as ipecacuanha, emetic tartar, or rhubarb; and this practice had often good effects in the chronic ſtage: but upon the whole I preferred their alternate uſe to combining them; as the emetic, if in ſufficient quantity to produce ſenſible effects, occaſioned a diſtreſſing nauſea, and the opiate too much checked the effects of the purgative. It did not appear of much conſequence, whether the opiate was given in a liquid, or a ſolid form. In ſome caſes the Dover's powder[*], in the doſe of ten or fifteen grains, had good effects. It happened in this diſeaſe, as in others where opiates are given, that the head or ſtomach were ſometimes diſagreeably affected by them the next day. To obviate this various means were tried, none of which ſucceeded ſo well, as giving one or two ſpoonfuls of lemon-juice along with the opiate, though that often failed.

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[*] Pulvis ipecacuanhæ comp. Pharm. Lond. 1788.

CHAP.

CHAP. V.

Of the Colic, or Dry-Belly-Ach.

SECT. I. *Of the Symptoms of the Dry-Belly-Ach.*

THE dry-belly-ach was formerly much more frequent in Jamaica, than it is at preſent. It is not confined to any particular ſeaſon of the year, but prevails ſometimes in one, ſometimes in another; and at ſuch times it cannot be ſaid to be epidemic, as it is frequently confined to one place, and to perſons of a particular deſcription. In the months of April, May, and June, 1781, it was very frequent among the men of the 92d regiment at Spaniſh Town, while the better ſort of the inhabitants were not at all affected by it. In the year following, there was occaſion to make the ſame obſervation at Kingſton, where the colic was prevalent among the private men of the 79th regiment. It proceeded from a cauſe, whoſe operation was confined almoſt entirely to the common ſoldiers, and which affected in an inconſiderable degree the lower claſs of inhabitants.

The diſeaſe began with ſlight uneaſineſs in the bowels, which was ſoon followed by great pain, accompanied with dejection, anxiety, and reſtleſſneſs. The pain was of a dull kind, and generally confined to one part of the abdomen, which diſtinguiſhed it from gripings of the bowels. It was aggravated by preſſure on the part more immediately affected, though the ſick ſometimes thought themſelves relieved by a general compreſſion of the abdomen. After a time the pain increaſed, and often became excruciating, in ſo much that men of great reſolution could not lie quiet a moment, but were conſtantly rolling about, and complaining even aloud of their ſufferings. Nature indeed ſeemed unable to ſupport the torments of the diſeaſe, and there were many inſtances of the ſick falling into ſtrong convulſions, and epileptic fits, and of their remaining in a ſtate of total inſenſibility for many hours. After the pain had continued ſome time, ſickneſs at ſtomach generally came on, together with vomiting and violent retchings; a glaſs of water, in ſome caſes, would not remain even a few minutes upon the ſtomach.

The pulſe was not quicker than natural, nor was there any heat upon the ſkin at the beginning of the complaint; but in its progreſs the pulſe generally became more frequent, which appeared to proceed more from the pain and ſufferings of the ſick, than the preſence of fever. During the whole of the diſeaſe there prevailed a moſt obſtinate conſtipation of the bowels, and there was often more or leſs of ſtrangury. The duration, and alſo violence of the ſymptoms, admitted of great variety; but as means of relief were immediately had recourſe to, and the diſeaſe was not allowed to run its courſe, it is not ſo eaſy to ſay what its natural progreſs would have been. The ſtrength of the diſeaſe was broken as ſoon as a free paſſage could be obtained. In ſome caſes this was effected in the courſe of twenty-four hours, though more commonly not before the end of the ſecond or third day; and in ſome inſtances, where the diſeaſe was very bad, it was the tenth or eleventh day before evacuations were procured.

Thoſe, who have once had the diſeaſe, remain liable to relapſes, which are generally more violent than the firſt attack; and their recovery becomes every time more ſlow, and leſs complete. The ſtrength decays, the fleſh waſtes, particularly the muſcles of the arms, and in a moſt remarkable degree the ball of the thumb; the complexion becomes pale and ſallow, and the countenance expreſſive of much dejection. In this ſtate, and commonly after a ſecond or third attack of the colic, they become paralytic.

The palſy may be conſidered as the ſecond ſtage of the diſeaſe. It ſeldom follows the firſt attack of colic, and not often the ſecond, unleſs it has been violent; but few eſcape more or leſs of it after a third, or fourth fit. The palſy comes on as the pain of the bowels abates; the ſick complain of pain and ſoreneſs in the arms, eſpecially about the wriſts, and they find themſelves unable to move the arms, and particularly to perform thoſe motions that depend upon the wriſt. This is the ſlighteſt degree of palſy, but it is often more ſevere, and the ſick cannot move either the arms, hands, or fingers. The palſy is moſt commonly confined to the upper extremities, though there are numerous examples of the lower being affected alſo: there are not indeed wanting inſtances of an almoſt total palſy, which followed ſome colics of unuſual violence, and long duration. The ſick lay on their back without motion in their legs or arms, with little or no power over the muſcles of the neck and head, with a voice no louder than a whiſper, and in two caſes to theſe ſymptoms was ſuperadded almoſt a total loſs of ſight, and hearing. Their recovery from ſuch a ſituation is always extremely ſlow, and often incomplete; yet there were few to whom the diſeaſe proved fatal; for of ſeveral hundreds that were ill not more than four or five died, and thoſe were not in the paralytic ſtage of the diſeaſe, but in the convulſions and fits produced by the colic. Yet, though few died, many were loſt to the ſervice; for ſome never recovered the uſe of their wriſts at all, and many more never acquired any ſtrength either in their wriſts or arms, and became of courſe unfit for ſoldiers.

It muſt be obvious, that in giving this ſhort deſcription of the colic, that was prevalent among the ſoldiers at Kingſton, and Spaniſh Town, I have been deſcribing a diſeaſe exactly ſimilar in its ſymptoms, progreſs, and conſequences, to the *colica pictonum*, or painter's colic; and I might perhaps with propriety have referred to the full deſcriptions, and accurate accounts of this diſeaſe, which have been publiſhed by ſome able and learned authors*; but I was willing to enable every one, by a ſhort hiſtory of the dry-belly-ach, to draw his own concluſions reſpecting the identity of the two diſeaſes.

SECT. II. *Of the Cure of the Dry-Belly-Ach.*

THE principal and leading object in the cure is, to procure a free paſſage, by removing or overcoming the ſpaſms and contractions of the bowels, that occaſion the obſtinate coſtiveneſs. Till this can be done, the ſick have no relief from their ſufferings. If there be no ſickneſs or vomiting, a ſtrong purge is given directly; but that cannot be done if the ſtomach be irritable and out of order, for without much precaution any purgative, even the gentleſt, becomes an emetic. The purgative that was found upon the whole to anſwer beſt was, two ſcruples of rhubarb, and five grains of *mercurius dulcis* *, made into twelve pills with a little ſyrup, of which four were given at a time, and they were repeated every half hour, or every hour, according to the ſtate of the ſtomach. A ſecond quantity, and even a third, were often neceſſary, but in that caſe the *mercurius dulcis* was diminiſhed, or entirely omitted, leſt it ſhould affect the mouth.

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* Vid. Med. Tranſ. Vol. II. p. 68. — Vol. III. p. 407.

To relieve the pain, fomentations were applied to the abdomen, or recourſe was had to a warm bath. The eaſe obtained by theſe means was of ſhort duration. A large bliſter, applied to that part of the abdomen where the pain was greateſt, more effectually procured relief, as ſoon as it began to riſe; and it was further of great uſe in promoting the operation of the purgative, for in general it was obſerved, that ſoon after the pain became eaſier free evacuations followed.

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* Calomel, vel Hydrargyrus Muriatus mitis, Pharm. Lond. 1788.

Purgative clyſters were thrown up from time to time, in order to promote the operation of the purgative. Of the various compoſitions uſed for this purpoſe, none appeared better than a ſolution of common ſalt in water, conſiſting of half an ounce, or even a whole ounce, to a pint of water. The addition of other articles, often conſidered as more ſtimulating, appeared to do but little good.

If there were much vomiting or retching, warm water, or an infuſion of chamomile flowers, was given; and after the ſtomach was quieted a little, the purging pills were adminiſtered as before, but with the addition of one or two grains of opium, to prevent their being thrown up. If it were neceſſary to repeat the pills, the opium was omitted in a ſecond or third quantity.

In general, by the means already mentioned, ſtools were procured, and the diſeaſe was overcome; yet this was not always the caſe, for the pain and coſtiveneſs would ſometimes remain, after every thing recommended above had been carefully put in practice. Under ſuch circumſtances recourſe was had to other purgatives, as jalap, the *extractum catharticum* *, the purging ſalts, and the *oleum ricini*. It may ſeem that ſome of theſe, as the jalap, and *extractum catharticum* ſhould have had a trial before the rhubarb and *calomel*, as they are known to be more powerful purgatives. But thoſe ſubſtances appear to have their virtues much impaired by keeping, in a warm climate; for they were found not to poſſeſs the ſame ſtrength as in Europe. The rhubarb alſo is leſs powerful, but with the addition of the calomel it formed a purge, which more commonly than any other had the deſired effect. When this failed, of the purgatives mentioned above, the purging ſalts were perhaps the beſt, if the ſtate of the ſtomach admitted of their uſe. An ounce and an half of bitter purging ſalt † were diſſolved in three gills of water, to which were added a drachm and a half of the *ſpiritus lavendulæ compoſitus*, and three drops of the oil of peppermint, and of this three or four table ſpoonfuls were given every half hour. The caſtor oil was a good medicine, when the ſtomach would retain it;

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* Extract. Colocynthidis comp. Pharm. Lond. 1788.

† Magneſia Vitriolata, Pharm. Lond. 1788.

a table ſpoonful was given for a doſe, in a little broth, and it was repeated every hour. It may be obſerved in general, that whatever purgative was employed, regard was not had to the common doſe, which would not have been ſtrong enough; but it was repeated from time to time, either till it diſagreed with the ſtomach, or till it operated.

If the pulſe became quick from the violence of the pain and the ſeverity of the diſeaſe, provided it were the firſt attack, and the patient were full and plethoric, a ſmall bleeding, from ſix to eight ounces, promoted in ſeveral inſtances the ſolution of the diſeaſe.

It became an object of much conſequence in the treatment of the colic, to prevent, if poſſible, the palſy. That, as far as it could be effected, appeared to depend intirely on the ſpeedy cure of the colic; for, the more violent it was, and the longer it continued, the greater reaſon was there to fear a palſy would enſue. The remedies, given againſt the colic, have ſometimes been accuſed of producing the paralytic affection; but certainly without foundation. The only effects they could have, either in preventing or producing that ſtage of the diſeaſe, muſt depend upon their being more or leſs efficacious in removing the colic.

After the firſt evacuations by ſtool were procured, though the ſtrength of the diſeaſe was broken, there ſtill remained in many caſes a diſpoſition to coſtiveneſs, with more or leſs of pain in the abdomen; for the removal of which, it was proper to give opening medicines from time to time, as the *oleum ricini*, aloetic pills, gum guajacum diſſolved in ſpirits, or any other that agreed with the patient. Thoſe often brought away ſmall balls of hardened *fæces*, ſeveral days after the paſſage of the bowels appeared to have been opened.

Bitters, as an infuſion of chamomile flowers, or gentian*, were given to ſtrengthen the ſtomach.

The ſecond ſtage of the diſeaſe, the palſy, is always a moſt obſtinate complaint, and in many caſes the ſick never recover completely, either the ſtrength, or motion, of the arms, or wriſts. The Bath † waters have long been celebrated for their virtues in this ſtage of the diſeaſe: by bathing in them many have had the uſe of their limbs reſtored *. There is reaſon to think, that their good effects depend entirely upon their virtues as a warm bath; and this opinion has been confirmed, by ſuch trials as I have made of the warm bath, in the cure of the palſy. It was nearly as effectual as the Bath waters; but the difficulty of preſerving a proper and uniform degree of heat, in an artificial warm bath, for any length of time, muſt always give a decided preference to natural warm ſprings. It may frequently happen however that thoſe cannot be come at, in which caſe warm bathing forms an excellent ſubſtitute. The temperature of the ſea, near the ſhore in the Weſt Indies, is not leſs than 84° about the middle of the day, and bathing in it would probably be as efficacious in the cure of palſy as the Bath waters. But in this particular my experience is very limited, for the paralytic men were all ſent home with the invalids, as there was hardly a chance of their ever being again fit for ſoldiers.

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* Infuſum gentianæ comp. Pharm. Lond. 1788.

† There is in the pariſh of St. Thomas's in the Eaſt, in the iſland of Jamaica, a warm mineral water of nearly the ſame temperature as the waters of Bath in Somerſetſhire. The heat of it is about 123° of Farenheit, and it is extremely beneficial in the palſy.

There was frequently much pain in the paralytic limbs, and at times puffy ſwellings

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* Vid. Charlton on Bath waters.

in particulrr parts, which appeared and diſappeared ſuddenly. Both thoſe ſymptoms were relieved by the *linimentum volatile**; and when the pains were violent, eaſe was procured by opiates.

In ſome few caſes the pain in the bowels ſhifted ſuddenly to the head, the miſery of the patient became extreme, and in one inſtance a temporary madneſs enſued. In this ſtate nothing procures equal relief with bliſters, applied to the back, behind the ears, and to the temples, ſucceſſively, as the violence or duration of the pain may require. Opiates alſo procure a ſlight mitigation of the ſufferings of the ſick.

I ſhall conclude theſe obſervations, with ſome remarks on the remedies uſually recommended in this diſeaſe. The French†, among whom the diſeaſe is frequent, give emetic tartar; but in all the examples of the diſeaſe that have fallen under my obſervation, the vomiting was a troubleſome ſymptom, and a great impediment to the cure; and therefore whatever was likely to excite it, was carefully avoided. The practice would appear to be bad, but as I have no experience of it, I dare not decide upon its merits.

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* Linimentum Ammoniæ, Pharm. Lond. 1788.

† Vid. Med. Tranſ. Vol. II. p. 459.

Phyſicians have been much divided with reſpect to the uſe of opiates in this diſeaſe; ſome of great note adviſe, to truſt chiefly to them in the cure of the colic, aſſerting that they allay the pain, remove the ſpaſms of the bowels, and contribute greatly to a ſpeedy ſolution of the diſeaſe, by rendering the operation of purgatives more eaſy and certain; while others, of no leſs name, entirely forbid the uſe of opiates, till a free paſſage has been procured. I muſt own that my experience, as well in this country as in Jamaica, coincides with the latter opinion. The relief procured by opiates was inconſiderable, till the body was opened, and ſome of the worſt caſes that I ſaw had been treated with opiates in the beginning. A deſire to allay the excruciating pain is the cauſe that they are frequently given; but the only circumſtances under which I have found them of advantage were, when the ſtomach was very irritable, and they were united to a purgative, to prevent it from being thrown up.

It is not probably of much conſequence what purgative is given, provided it operate effectually. In this country the *extractum carthaticum* * with the *mercurius dulcis*, and if neceſſary a ſmall proportion of opium, are very effectual; and I prefer a compoſition of this kind to the rhubarb and *mercurius dulcis*. Half a drachm of the extract, with five grains of calomel, and a grain and a half of opium, are made into eight pills, of which two are given every hour, or every two hours, according to the ſtate of the ſtomach, till they operate. A ſecond quantity is often conſumed, and ſometimes a third, in both of which the opium is generally omitted, before an evacuation is procured. The calomel could not be given ſo freely in the Weſt Indies, for five grains of it were oftener than once productive of much inconvenience, by exciting ſalivation, with conſiderable ſwelling, pain, and inflammation about the mouth and throat. The conſtitution in that climate is peculiarly ſenſible to the effects of mercury, contrary to what might have been expected, were the opinions uſually entertained on this ſubject true; for, if a determination of the humours to the ſkin could prevent mercury from affecting the mouth, it ought to be a difficult thing to excite a ſalivation in Jamaica, where the perſpiration is at all times profuſe.

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* Extractum Colocynthidis compoſitum, Pharm. Lond. 1788.

Clyſters of various kinds were made uſe of at different times. Warm water with ſome oil relieved the ſtrangury. Common ſalt was more ſtimulating than either the Glauber's, or bitter purging ſalt. Some trials were made of throwing up the ſmoke of tobacco, but the dreadful ſickneſs it occaſioned, ſo much aggravated the ſufferings of the patient, that it was laid aſide, perhaps before we had found out the beſt manner of managing it.

SECT. III. *Of the Cauſes of the Dry-Belly-Ach.*

IT will not be deemed neceſſary, to enter into any detail on this part of the ſubject, after what I have advanced in another place*.

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* The paper here alluded to, containing experiments to aſcertain the cauſe of this colic, is publiſhed in the 3d volume of the Medical Tranſactions of the College of Physicians in London; and as being intimately connected with the preſent ſubject, I have given it in the Appendix.

That lead taken into the body, in all its various forms, produces colic and palſy, is a fact as well eſtabliſhed as any in phyſic. Nor is it material whether the lead be in vapour, as among ſmelters; in a metallic ſtate, as among glaziers and plumbers; in a calx, as among painters, and the manufacturers of white lead; or in a ſaline ſtate, as in wine and cyder: under every form it is equally productive of the diſeaſe in queſtion. The quantity of lead requiſite to produce the diſeaſe admits of conſiderable variation, for there are clear proofs of its ariſing from a few grains of *Saccharum Saturni**, and alſo well authenticated caſes, in which that ſalt has been given liberally, and without any immediate ill effect. But what is to be inferred from this more, than that there are ſome conſtitutions affected in a ſhorter time, and by a ſmaller quantity of this poiſon, than others†? An obſervation applicable not only to every poiſon, but every active medicine, with which we are acquainted.

That the dry-belly-ach is the effect of lead, ſome how introduced into the body, cannot reaſonably be doubted; and the new rum, diſtilled in improper veſſels, appears to be the vehicle in which it finds admiſſion. I have not yet met with any facts or obſervations, to induce me to change the opinion I advanced on this ſubject. It were to be wiſhed however that the matter were proſecuted further, by examining the rum as it comes from the ſtill, and alſo by aſcertaining the contents of the ſediment that is found in the veſſels, in which new rum has been kept ſome time. Such inquiries cannot ſo well be made in this country as in the Weſt Indies.

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* Med. Tranſ. Vol. I. p. 304.

† Ibid. p. 257.—Vol. II. p. 419.

I cannot deny myſelf the pleaſure of inſerting in this place, a letter from Dr. Franklin to his friend Mr. Vaughan, in which the opinion I have advanced, reſpecting the cauſe of the colic in the Weſt Indies, is illuſtrated and confirmed in ſome degree, by what happened in New England. Though ſeveral of the facts mentioned in the letter are already before the public, I have not choſen either to abridge it, or to give it in other words than thoſe, in which the doctor ſo clearly expreſſes himſelf.

Philadelphia, July 31, 1786.

" Dear Friend,

" I recollect that when I had the great " pleaſure of ſeeing you at Southampton, " now a twelvemonth ſince, we had ſome " converſation on the bad effects of lead taken " inwardly; and that at your requeſt I pro- " miſed to ſend you in writing a particular " account of ſeveral facts I then mentioned " to you, of which you thought ſome good " uſe might be made. I now ſit down to " fulfil that promiſe.

" The firſt thing I remember of this kind, " was a general diſcourſe in Boſton when I " was a boy, of a complaint from North " Carolina againſt New England rum, that " it poiſoned their people, giving them the " dry-belly-ach, with a loſs of the uſe of " their limbs. The diſtilleries being examined " on the occaſion, it was found that ſeveral " of them uſed leaden ſtill-heads and worms, " and the phyſicians were of opinion that the " miſchief was occaſioned by that uſe of lead. " The legiſlature of the Maſſachuſſetts there- " upon paſſed an act, prohibiting, under ſe-

“ vere penalties, the uſe of ſuch ſtill-heads “ and worms thereafter.

“ In 1724, being in London, I went to “ work in the printing-houſe of Mr. Palmer, “ Bartholomew-Cloſe, as a compoſitor. I “ there found a practice, I had never ſeen “ before, of drying a caſe of types, (which “ are wet in diſtribution) by placing it “ ſloping before the fire. I found this had “ the additional advantage, when the types “ were not only dried but heated, of being “ comfortable to the hands working over “ them in cold weather. I therefore ſome- “ times heated my caſe when the types did “ not want drying. But an old workman “ obſerving it, adviſed me not to do ſo, tell- “ ing me I might loſe the uſe of my hands by “ it, as two of our companions had nearly “ done, one of whom that uſed to earn his “ guinea a week could not then make more “ than ten ſhillings, and the other, who had “ the dangles, but ſeven and ſixpence. This, “ with a kind of obſcure pain that I had “ ſometimes felt as it were in the bones of “ my hand when working over the types “ made very hot, induced me to omit the “ practice. But talking afterwards with

" Mr. James, a letter-founder in the ſame " cloſe, and aſking him if his people, who " worked over the little furnaces of melted " metal, were not ſubject to that diſorder; he " made light of any danger from the effluvia, " but aſcribed it to particles of the metal " ſwallowed with their food by ſlovenly " workmen, who went to their meals after " handling the metal, without well waſhing " their fingers, ſo that ſome of the metalline " particles were taken off by their bread, and " eaten with it. This appeared to have ſome " reaſon in it. But the pain I had expe- " rienced made me ſtill afraid of thoſe " effluvia.

" Being in Derbyſhire at ſome of the " furnaces for ſmelting of lead ore, I was " told that the ſmoke of thoſe furnaces was " pernicious to the neighbouring graſs and " other vegetables; but I do not recol- " lect to have heard any thing of the effect of " ſuch vegetables eaten by animals. It may " be well to make the enquiry.

" In America I have often obſerved that " on the roofs of our ſhingled houſes, where " moſs is apt to grow in northern expoſures, " if there be any thing on the roof painted with white lead, ſuch as baluſters, or frames of dormant windows, &c. there is conſtantly a ſtreak on the ſhingles from ſuch paint down to the eaves, on which no moſs will grow, but the wood remains conſtantly clean and free from it. We ſeldom drink rain-water that falls on our houſes; and if we did, perhaps the ſmall quantity of lead deſcending from ſuch paint, might not be ſufficient to produce any ſenſible ill effect on our bodies. But I have been told of a caſe in Europe, I forget the place, where a whole family was afflicted with what we call the dry belly-ach, or *colica Pictonum*, by drinking rain-water. It was at a country ſeat, which being ſituated too high to have the advantage of a well, was ſupplied with water from a tank which received the water from the leaded roofs. This had been drank ſeveral years without miſchief; but ſome young trees planted near the houſe, growing up above the roof, and ſhedding their leaves upon it, it was ſuppoſed that an acid in thoſe leaves had corroded the lead they covered, and furniſhed the water of that year with its baneful particles and qualities.

" When I was in Paris with Sir John
" Pringle in 1767, he viſited *La Charité*, an
" hoſpital particularly famous for the cure of
" that malady, and brought from thence a
" pamphlet, containing a liſt of the names of
" perſons, ſpecifying their profeſſions or
" trades, who had been cured there. I had
" the curioſity to examine that liſt, and found
" that all the patients were of trades that
" ſome way or other uſe or work in lead;
" ſuch as plumbers, glaziers, painters, &c.
" excepting only two kinds, ſtone-cutters
" and ſoldiers. In them, I could not recon-
" cile to my notion that lead was the cauſe of
" that diſorder. But on my mentioning this
" difficulty to a phyſician of that hoſpital, he
" informed me that the ſtone-cutters are
" continually uſing melted lead to fix the ends
" of iron baluſtrades in ſtone; and that the
" ſoldiers had been employed by painters as
" labourers in grinding of colours.

" This, my dear friend, is all I can at
" preſent recollect on the ſubject. You will
" ſee by it, that the opinion of this miſchie-
" vous effect from lead, is at leaſt ſixty years
" old; and you will obſerve with concern how
" long a uſeful truth may be known, and

" exiſt, before it is generally received and
" practiſed on.

" I am, ever,
" Yours moſt affectionately,
" B. FRANKLIN."

The law above alluded to forbids the uſe of leaden heads or worms, under proper penalties; it further prohibits the artificers who make ſuch from uſing any lead in their compoſition; and it appoints aſſay-maſters, with power to examine and report upon all heads and worms, employed in the diſtillation of rum, or ſpirits*.

SECT. IV. *Of the diſtinguiſhing Symptoms of the Dry-Belly-Ach, the* Choliera Sicca *and* Colica Bilioſa *of Sydenham.*

I HAVE not thought it neceſſary to treat of cholera, becauſe though a frequent diſeaſe in the beginning of the ſickly ſeaſon in Jamaica, it is no way different from the ſame complaint that appears in this country in the months of July and Auguſt, if the ſummer prove hot. The method of cure alſo is the ſame as delivered by Sydenham. But this diſeaſe, the *colica bilioſa* of Sydenham, and certain caſes of incipient dyſentery, have been confounded by ſome writers with the *colica Pictonum*, or dry-belly-ach, which could never have happened, if they had been converſant with the laſt mentioned diſeaſe. On this account I have here given the diſtinguiſhing marks of theſe diſeaſes. They are indeed ſo different, that it may ſeem extraordinary that they ſhould be taken for one another. The miſtake has happened in this way; in the beginning of the ſickly ſeaſon in warm climates, and in the months of July and Auguſt in England in hot ſummers, choleras, colick pains of the bowels, and dyſenteries, are prevalent. Of thoſe diſeaſes there are certain caſes, in which with excruciating pain in the epigaſtric region there is great vomiting, but no purging, at leaſt for ſome time. Sydenham with his uſual fidelity has taken notice of theſe forms of thoſe diſeaſes, and ſpeaks of the *cholera ſicca* *; and ſtates the caſe of dyſentery in which there is no evacuation whatever downward †. Such caſes, as alſo the *colica bilioſa* ‡, have been miſtaken for the dry-belly-ach, or *colica Pictonum*; but as they are very different diſeaſes ſo it is eaſy to diſtinguiſh them.

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* The act was paſſed in 1723 (10 Geo. I. c. 2.)

The *colica Pictonum* is not a diſeaſe of any particular climate, or any ſeaſon, but occurs indiſcriminately in all places and at all ſeaſons, whenever the human body is expoſed to the poiſonous action of lead. Whereas the *cholera*, the *colica bilioſa*, and dyſentery without ſtools, occur in the hot months, or in the ſickly ſeaſons in hot climates; and they are moſt frequent at the commencement of ſuch ſeaſons; and affect with great violence thoſe who are ſuddenly expoſed to their cauſes, which is the caſe chiefly with Europeans, who immediately change, on their arrival in warm climates, the pure air of the ſea for the air of an harbour loaded with exhalations from the land; and choleras, diarrhœas, and dyſenteries are often the immediate conſequences. In ſome of theſe, there is at firſt no evacuation downwards, and thence ſome reſemblance in the ſymptoms to the *colica Pictonum*. But the manner of attack, the progreſs of the ſymptoms, and the terminations are totally different. In *cholera ſicca*, *colica bilioſa*, and the form of dyſentery above mentioned, from the beginning of thoſe diſeaſes there are ſymptoms of fever: the ſkin is hot, the pulſe quick, and the tongue white. In the *colica Pictonum* there is no fever in the beginning, and it is only excited by the long continuance of the pain. The *cholera ſicca*, and *colica bilioſa* are extremely acute diſeaſes; often going thro' their courſe in a few hours, ſeldom extending beyond a day or two; whereas the *colica Pictonum* comes on ſlowly, increaſes gradually, and continues many days, ſeldom yielding even to medicine in leſs than two or three, and ſometimes extending to ten, or twelve days. In the *cholera*, and *colica bilioſa*, the great difficulty in procuring ſtools is to get the purgative to ſtay on the ſtomach; for if it is not thrown up, ſtools are ſoon procured; and the firſt evacuation is generally followed by many more. The caſe is quite different in the *colica Pictonum*; the conſtipation is obſtinate even after large quantities of cathartic medicines have been ſwallowed and retained; and when they do operate, it is ſeldom copiouſly; the bowels are ſtill diſpoſed to conſtipation, and opening medicines are from time to time neceſſary, to preſerve a paſſage through the body. The cholera is almoſt always accompanied with ſpaſms of the thighs and legs, which I never ſaw in the *colica Pictonum*. What however may be conſidered as peculiarly characteriſtic of the *colica Pictonum*, is the paralytic affection that follows it, particularly of the hands and wriſts. Such a termination of *cholera*, *colica billioſa*, or any kind of dyſentery is never ſeen, but it is a frequent occurrence in the *colica Pictonum*, and no means have hitherto been diſcovered by which it can be prevented.

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* Sect. iv. Cap ii. Cholera Morbus, an. 1669.

† —Primo quo invaſit autumno (de dyſenteria loquitur), quam plurimi nullis omnino dejectionibus moleſtabantur; torminum vero quod ſpectat atrocitatem, aliaque ſymptomata, inſequentium annorum dyſenterias longo intervallo poſt ſe reliquit. Sydenham. Op. Sect. iv. Cap. iii. de Dyſenteria partis an. 1669, &c.

‡ Sydenham Op. Sect. iv. Cap. vii. de ColicaIllioſa, an. 1670, &c.

CHAP.

CHAP. VI.

Of SORES *and* ULCERS.

SORES and ulcers in the lower extremities were frequent at all ſeaſons of the year, and in all the different quarters where the ſoldiers were ſtationed. They, together with fevers and fluxes, amounted to 19-20ths of the ſick received into the hoſpitals, all other complaints not being more than 1-20th, if particular times be excepted, when the dry-belly-ach or ſmall-pox were prevalent. The proportion of ſores in the hoſpitals, though always conſiderable, admitted of great variation. At Spaniſh Town and Kingſton they were often 1-3d, at Fort-Auguſta 1-half, and at Stoney Hill 2-3ds of the whole number in hoſpital. They ariſe from the moſt trifling cauſes; a ſcratch, an hurt, or bruiſe in the lower extremities, are ſufficient to produce a ſore, which it is always difficult to heal, and ſometimes impoſſible. Old ſores often break out anew, and prove equally obſtinate.

A common cauſe of ſores is an inſect called a *chiger* *. It is of the flea kind, and extremely ſmall. It lays its eggs in the ſkin in an uncommon manner, for it is ſaid to bury itſelf in the fleſh, and become a *nidus* for its own *ova*. The part, where it has thus depoſited itſelf, after a little time ſwells, becomes red, and itches much. At this period, it is the common practice, to pick out of the ſkin with a fine needle the bag formed by the body of the parent inſect, in which are contained the rudiments of the young. If this be neglected, the inflammation increaſes, ſuppuration takes place, and an ulcer is formed. The inſect harbours moſt commonly in duſt upon the floor or ground, and generally depoſits its *ova* in the toes and feet; and many of the men loſt one or more of their toes, by ulcers ariſing from this cauſe.

Sores, in whatever way produced, ſpread quickly, and form a large ulcerated ſurface. They give little or no pain, which appears to be owing in a great degree to the warmth of the air, for cuts and wounds are found to give much leſs pain in a warm, than in a cold climate. The appearances of the ulcers are conſtantly varying; at times they acquire the look of an healthy ſore, ſend forth ſtrong and luxuriant granulations, and begin to ſkin over; but one night will often put an end to this flattering proſpect. The granulations turn flaccid, or even mortify in part, the portion ſkinned over ulcerates afreſh, and the ſore becomes larger than ever. After a time it will again put on an healing appearance, and repeatedly run through the ſame ſtages. The bones at laſt become carious, and if the limb be not either amputated, or the patient ſent off the iſland, he becomes hectic, and after lingering a conſiderable time, dies.

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* Pulex penetrans, Linnæi Syſt. Nat.

The extreme difficulty, indeed almoſt impoſſibility, of healing an ulcer in the lower extremities, after it had become of a certain ſize, neceſſarily produced an accumulation of ſuch caſes in the hoſpitals. Various means of cure were attempted, the principal of which it will be ſufficient to mention ſhortly, as none of them were attended with conſiderable ſucceſs.

It was ſuppoſed, as the ſoldiers arrived in the iſland after being a long time at ſea, and as they had ſalt proviſions after landing, that they might have more or leſs of ſcurvy in their habit, which would render the ulcers difficult of cure. On this ſuppoſition they were put upon a vegetable diet, which for a time had good effects upon ſome, but in the end failed.

The powers of the conſtitution having evidently ſuffered, it was imagined they might be reſtored by the uſe of bark, with a full and nouriſhing diet. This plan was accordingly tried, and produced at firſt favourable changes, but was not finally more ſucceſsful than the former *.

Alterative medicines, as ſmall doſes of calomel, were given, but they did no good. The changes, which the ulcers of themſelves underwent, occaſioned for a time ſome degree of deception as to the good effects of the treatment made uſe of; for the favourable appearances of the ulcers, coinciding as to time with the medicines directed, raiſed expectations at firſt, which, in the end, were diſappointed. But it muſt be allowed, that in many caſes the means employed produced a temporary amendment, and promoted to a certain degree the efforts of nature to effect a cure; yet the powers of the conſtitution were

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* See note P in the Appendix.

ſo feeble, that with all the aſſiſtance that could be given, they could not bring it to a completion. They advanced a certain way, but ſoon fell back again.

External applications of various kinds were tried, and what has been ſaid of the internal remedies will equally apply to them; they often produced a favourable change at firſt, but it was not permanent. Among the different dreſſings that were made trial of were ointments, ſometimes ſtimulating, ſometimes emollient, fermenting poultices, the common bread and milk poultice, and dry lint. An application common among the inhabitants deſerves to be taken notice of, as it ſometimes had better effects than any of thoſe juſt mentioned, I mean roaſted limes.

An horizontal poſition with quiet did good as in other countries, and if neglected, the progreſs of ulcers became extremely rapid.

The general reſult of all my experience was, that ulcers of ſome ſtanding, and of a conſiderable ſize, in the lower extremities, could not be healed in that country by any means that we were acquainted with. Inſtead therefore of waſting time in fruitleſs trials, every opportunity was taken of ſending home the men with ulcers, along with the other invalids. The change of air and climate produced great effects; many of the ulcers healed on the paſſage, and all of them ſoon got well after their arrival in England, unleſs where the bones were carious; and of theſe laſt many recovered, after loſing large portions of the *tibia* by exfoliations, or were finally reſtored to health, by an amputation of the diſeaſed limb. This operation was indeed ſometimes performed in Jamaica, but never except under the moſt urgent circumſtances, for it ſeldom ſucceeded, owing to the locked jaw, which generally came on in a few days, and proved fatal. I cannot help therefore concluding, that humanity as well as the good of the ſervice require, that all bad ulcers ſhould be ſent home without loſs of time from the Weſt Indies, unleſs ſome more effectual means of cure ſhould be diſcovered, than thoſe with which we are hitherto acquainted.

Although ulcers can ſeldom be cured in the Weſt Indies, they may often be prevented. The chigers get to the toes and feet by the men going without ſhoes or ſtockings; who, from the ſame cauſe are alſo more expoſed to ſcratches and bruiſes in thoſe parts, which quickly become ulcers, if not treated directly with great attention. If care were taken, that they ſhould never go without ſhoes and ſtockings, or trowſers in the room of ſtockings, it would prevent many ulcers, particularly at Stoney Hill, where the chigers are very numerous, though in other reſpects it be the moſt healthy quarter in the iſland. At Fort-Auguſta, Port-Royal, and other quarters near the ſea, the men in fiſhing or wading in the water for their amuſement, often cut their feet upon the ſtones and rocks, and ſo give riſe to ulcers, which it would not be difficult to prevent.

CHAP. VII.

Of ſome other Diſeaſes to which Soldiers are ſubject.

OF the following diſeaſes, which all together form a very inconſiderable proportion of the ſick liſt, there are few peculiarities, either in their hiſtory or treatment, depending upon the climate; yet ſuch as there are, I thought it might not be without uſe to take notice of ſhortly.

SECT. I. *Of the Venereal Diſeaſe.*

OF the few things peculiar to this diſeaſe, in the Weſt Indies, it is perhaps the moſt ſingular, that it ſhould, at the preſent day, be much leſs frequent in a country ſuppoſed originally to have produced it, than in any part of Europe. This will not be conſidered as a proof, that the venereal diſeaſe had its origin in the Weſt Indies. In 331 patients admitted into the hoſpital of the 2d regiment, there were only two with venereal complaints; and in the other hoſpitals, the diſeaſe was not more frequent. Though leſs common than in Europe, it is not milder; on the contrary the proportion of caſes, in which the diſeaſe is violent and the ſymptoms run high, is greater. This is probably to be imputed to the bad habit of body, which not only makes it difficult to heal ſores in the extremities, but alſo renders the progreſs of inflammation in many caſes unfavourable, and tedious. In gonorrhœa, the inflammation of the urethra often extends to the bladder, producing ſtrangury, and the uſually concomitant ſymptoms. Chancres often produce *phimoſis* and *paraphimoſis*, and conſequent mortification. Such unfavourable ſymptoms are found to happen in patients, who are of a bad habit of body, in all countries. In one caſe the venereal blotches ulcerated, and three or four large ſores were formed upon the arms and ſhoulders, which could not be healed by any means that were tried; they remained after there was reaſon to believe, that all traces of the infection were eradicated. The patient was ſent home to England, and ſoon after he ſailed, the ſores began to heal, and were all well before he got to an end of the voyage.

The great ſenſibility of the conſtitution to the effects of mercury, in the Weſt Indies, often proves a conſiderable obſtacle to the cure of this diſeaſe. A ſalivation is frequently excited, before a ſufficient quantity of the medicine can be thrown in. Bark, in the quantity of three or four drachms a day, and the free uſe of opiates, together with an aſtringent gargle, made of a decoction of oak bark, to which ſome alum may be added, prevent the mouth from being either ſo quickly, or ſo violently affected. Of the ſeveral preparations of mercury, the *hydrargyrus calcinatus* was found to be the beſt for internal uſe.

It is worth remarking, that mercury had no effect upon the conſtitution to render it leſs ſuſceptible of fevers; for perſons under a courſe of that medicine were ſeized with the remittent fever; which however did not appear to be aggravated by the preſence of the mercury in the body.

SECT. II. *Of ſome Complaints ariſing from Inſects.*

BESIDES the chiger, there are other inſects that produce very troubleſome complaints, and none perhaps occaſion greater diſtreſs than muſquitoes [*]. They breed in water, and of courſe low marſhy grounds, and their neighbourhood, are particularly infeſted by them. They are moſt troubleſome in the morning and evening, during the calm that takes place between the land and the ſea breezes; they diſlike the wind. Their bite produces violent itching, inflammation, and ſometimes ſores in conſequence of ſcratching, from which it is difficult to refrain. When the proboſcis of a muſquito is examined with a microſcope, it is found to conſiſt of a ſheath containing ſmall pointed briſtles, with which it penetrates the ſkin while it ſucks, and when the inſect is bruſhed off ſuddenly, they are probably in part broken, and remain ſticking in the ſkin, and thereby contribute greatly to produce the tormenting itching, that is the conſequence of the bite of thoſe inſects, and which is always aggravated by ſcratching.

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[*] Culex pipiens, Linnæi Syſt. Nat.

Lime juice, or rum, are the applications commonly made uſe of, and they both allay the itching. A mixture of them, in equal parts, appeared to be more efficacious than either ſeparately. It has been propoſed by a writer *, who has examined the hiſtory of this inſect with the greateſt accuracy, to waſh the face and hands, or ſuch parts as are expoſed to the bites of muſquitoes, with the juice or decoction of certain herbs, which might poſſibly prevent them entirely from making their attacks upon the ſkin. It is probable experiments might in this way diſcover the complete means of prevention, and among other applications deſerving of trial, the writer above referred to, recommends an infuſion of pepper, wormwood, or rue; verjuice, pomatums, &c.

There is a large fly that produces often a dreadful diſeaſe, by depoſiting its *ova* in the mouth or noſe. It happens frequently to negroes, and we had ſeveral examples of it among the common ſoldiers. While they are ſleeping in the open air, the fly depoſits

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* Reaumur, Hiſt. des Inſects, vol. iv. p. 624.

its *ova* moſt commonly in the noſe, but ſometimes in the mouth. The pain, ſwelling, and inflammation about the face, after the maggots are formed and ready to break forth, are very great; and the poor ſufferers are almoſt diſtracted. The number of living maggots that come away is often conſiderable, and they are of a large ſize, being nearly half an inch long.

The uſual remedy in ſuch caſes is, inhaling the ſteam of a ſtrong decoction of the leaves of tobacco, through the mouth or noſe, according to the ſeat of the diſeaſe. It procures great relief. The tobacco is uſed on the ſuppoſition that it kills the maggots, but whether the good effects of it depend upon any power of that kind, or ſimply on the vapour and ſteam, I did not ſee a ſufficient number of caſes to determine. If the virtues of the tobacco have a conſiderable ſhare in the cure, it is probable that a weaker decoction or infuſion of the leaves, thrown up the noſe by a ſyringe, or uſed to waſh the mouth with from time to time, would prove more effectual in deſtroying the maggots than the vapour or ſteam.

WHILE ſpeaking of the diſeaſes produced by inſects, it will not be out of place to mention ſome ſingularities reſpecting the itch, a diſeaſe which ariſes from a particular ſpecies of inſect [*]. It has been doubted whether this diſorder really depends upon an inſect, but I have frequently ſeen them picked out of the ſkin, and examined them with a microſcope. They were firſt obſerved by *Bonomo* [†], and the figure given by him conveys a tolerable idea of the inſect.

In this country the itch commonly appears between the fingers, about the wriſts, and in ſuch parts of the body, as by a duplicature of the ſkin, are in ſome degree defended from the action of the air, and are of courſe warmer than the other parts. But this is not the caſe in the Weſt Indies; the diſeaſe ſpreads almoſt uniformly over the ſkin, which is probably to be imputed to the heat of the climate. In a temperature of the air between 80° and 90°, the inſect is not impelled to ſeek for ſhelter in the folds of the ſkin.

The itch is a diſorder productive in general of effects, which, though troubleſome and diſagreeable, can ſeldom be called dangerous; yet in certain ſituations I have ſeen it occaſion alarming ſymptoms, which have ſo far diſguiſed the diſeaſe, that it could not for a time be known to be the itch. The ſmall pointed watery veſicle, or puſtule, which characteriſes the itch, has been changed into an eating ſore, that in part deſtroyed the ſubſtance of the ſkin. Such effects, it was not at firſt imagined, could ariſe from the itch; but when it was obſerved to infect others, and produce in them the common appearances of the diſeaſe, it occaſioned a ſuſpicion of the nature of the complaint, which was confirmed by the readineſs with which all the ſymptoms yielded to the external application of ſulphur. I have never ſeen the effects of the itch juſt mentioned, except in children, and thoſe under the following circumſtances; either in the confined apartments of a workhouſe, where children are always unhealthy; or where, by miſtake, the diſeaſe has been allowed to remain a long time, in conſequence of which ulcers have been formed, the ſleep broken, and the general health greatly impaired. Under all circumſtances, however, the cure is equally eaſy and certain, for the diſeaſe yields as readily to the ſulphur ointment, when attended with the unuſual ſymptoms, as in its more common form.

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[*] Acarus ſiro, Linnæi Syſt. Nat.

[†] Phil. Tranſ. Vol. xxiii. p. 1296. an. 1703.

SECT. III. *Of Inflammatory Diſorders.*

INFLAMMATORY diſeaſes are very rare in Jamaica, though not always ſlight when they do occur. Catarrhs, coughs, inflammations of the breaſt, and of the lungs, are uncommon; yet in the months of March and April, when there is the greateſt difference between the temperature of the air in the day and in the night, they are ſometimes to be met with; and oftener at Spaniſh Town than Kingſton. Several of the ſoldiers were ſeized with inflammations of the breaſt, in conſequence of a ſtorm of wind and rain, which happened in the night-time at Spaniſh Town, and by deſtroying part of the roof of the barracks, expoſed the men to the cold and wet. One of them died, and the others recovered ſlowly; for, though the diſeaſe was ſoon overcome by bleeding and the uſual remedies, yet it was a conſiderable time before they regained their ſtrength, which was probably to be imputed to the neceſſary loſs of blood.

Inflammations of the eyes are frequent, obſtinate, and full of danger, for they often terminate in opacities of the *cornea.* The glare and heat of the ſun, ſtrongly reflected by the ground, devoid at certain ſeaſons of verdure; and the duſt rendered light and dry by heat, and put in motion by the trade wind, which often blows with violence during part of the day; are to be conſidered as the cauſes of the frequent inflammations of the eyes.

The bad habit of body, that prevails almoſt univerſally among Europeans, renders ſuch inflammations obſtinate, and in the end productive of opacities, and loſs of ſight. Having before mentioned a bad habit of body, and aſſigned it as a cauſe why ulcers in the lower extremities are ſo eaſily produced, and healed with ſo much difficulty; and having again conſidered it as the cauſe, which renders inflammations of the eyes obſtinate, and productive of the worſt conſequences; it may be aſked wherein this bad habit of body conſiſts, in order that too much may not be aſcribed to a cauſe, of which we have only a vague or ill-defined idea? To this I would anſwer, that the bad habit of body ſhews itſelf chiefly in a weakneſs of the powers of nature, in healing even trifling ſores from external injuries, and alſo in the readineſs with which inflammation of all kinds takes an unfavourable courſe. The powers of life, upon which the repair and ſupport of the ſimple ſolids of the body depend, appear to be weakened, though there be no evident diminution either of muſcular ſtrength, or animal ſpirits. It may be a queſtion, whether this weakneſs depend upon the heat of the climate, which at firſt produces a great ſenſe of laſſitude from the ſmalleſt exertions, and may ſtill operate unfavourably upon the body, after time and habit have got over the firſt diſagreeable feelings: or, whether it ariſes from the cauſe of fever, which prevails more or leſs at all times of the year, and may therefore operate inſenſibly on the conſtitution, without producing the diſeaſe; like to what ſometimes happens in the jail fever *. Facts and obſervations might be produced, ſome in favour of, and others adverſe to, each of the opinions

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* Med. Tranſ. Vol. III. p. 357.

above ſtated. It is not improbable, that there may be ſome foundation for both; but I forbear to enter farther on a ſubject, on which I am not provided with materials, from whence any certain concluſions can be drawn *.

Inflammations of the eyes, having often fatal terminations, ought not for a moment to be neglected, even though trifling at firſt; and the means, uſually employed againſt ſuch complaints, ſhould be put in practice with the utmoſt diligence. It would be ſuperfluous to enter into a detail upon this head, for I have not learned any thing peculiar to the treatment of the diſeaſe in that country.

The common ſore throat occurs now and then, and is almoſt always a ſlight diſeaſe.

It may deſerve to be taken notice of, that the meaſles is commonly a mild diſeaſe in Jamaica. It was frequent among the Duke of Cumberland's regiment in 1782-3, which conſiſted of Americans, of whom many had never had that diſeaſe. Few of them were ſo ill as to be taken into the hoſpital, and in thoſe the fever was very ſlight; and none of them were troubled either with complaints of their breaſt, or bowels, the uſual concomi-

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* See note P in the Appendix.

tants or conſequences of the meaſles. The diſeaſe appeared to be greatly mitigated by the warmth of the climate, which leſſened the diſpoſition to inflammation, particularly in the cheſt. Something analogous to this is to be obſerved in England; the meaſles are milder in the warmer months, and are much leſs apt to affect the lungs dangerouſly at ſuch times, than in the winter or ſpring. From ſome few caſes however that fell under my obſervation among the inhabitants, the meaſles may become a formidable diſeaſe, in conſequence of a ſubſequent dyſentery. Under thoſe circumſtances, the practice ſo ſtrongly recommended by Sydenham, that is bleeding, will rarely, if ever, be admiſſible in patients, whoſe conſtitutions are exhauſted both by the climate and the diſeaſe. The alternate uſe of opening medicines and opiates, as recommended in treating of the dyſentery, ſucceeded well; and there was room for employing aſtringents ſooner than in common caſes of dyſentery.

SECT. IV. *Of Conſumptions, Mania, and Prickly Heat.*

PULMONARY conſumptions rarely originate in the iſland, but thoſe who come from England with that complaint already begun, are not benefited by the warmth of the climate; on the contrary, the diſeaſe is precipitated, and proves ſooner fatal than it would have done in a more temperate air. Of this we had repeated examples among the ſoldiers, ſeveral of whom arrived in the iſland with beginning conſumptions, and were all quickly carried off by that diſeaſe.

It deſerves to be mentioned, that ſeveral examples of *mania* occurred among the troops. In ſuch caſes as fell immediately under my obſervation, the diſeaſe was evidently owing to an intemperate uſe of ſpirituous liquors; and ſome, while they could be prevailed upon to abſtain from ſpirits, were in a great meaſure free from the diſeaſe; but others, after being once attacked, continued for years to labour under that deplorable diſtemper.

Before I diſmiſs this ſubject, I may be permitted to take notice of a diſeaſe, if ſo trifling an affection deſerve that name, that is very common, I mean the *prickly heat*. Some are troubled with it all the year round; others only during the warmer months. Such as have fair and delicate complexions are more ſubject to it than others, inſomuch that they are not free from it at times either night or day. Some are incommoded by it only when expoſed to the heat of the ſun, or on making bodily exertions.

The prickly heat conſiſts of a ſmall red raſh, chiefly upon ſuch parts of the ſkin as are covered. It ſcarcely appears to the eye to be raiſed above the ſkin, though it gives a ſlight roughneſs to the feel. It is attended with a diſagreeable ſenſation of heat and pricking in the ſkin, as is well expreſſed by its name. It is ſuppoſed by ſome to be a ſalutary effort of the conſtitution, and the diſappearance of it is therefore dreaded as portending miſchief. I cannot ſay that I ever met with any facts to confirm this opinion. In the beginning of fevers, it is common for it to diſappear, if they are preceded by a chilly or cold fit, and to return again with the hot fit, but without appearing in either caſe to aggravate, or alleviate the diſeaſe.

The prickly heat probably depends upon a two-fold cauſe; the irritating action of the heat upon the ſkin, and the concentrated ſtate of the ſalts in the perſpirable matter. The rays of the ſun in warm climates are capable even of raiſing bliſters on the ſkin; and the perſpiration always being profuſe, the thinner parts ſoon fly off, and the remainder becomes more loaded with the animal ſalts, and is of courſe more irritating.

It requires no medicine, and the troubleſome effects ariſing from it, are beſt remedied, or prevented, by quiet and reſt.

CHAP. VIII.

Remarks on ſome of the Diſeaſes of NEGROES.

THE diſeaſes of negroes fell ſeldom under my obſervation; what I have to ſay of them therefore will be very ſhort, and chiefly with a view of calling the attention of others to the ſubject: for we are hitherto much in the dark reſpecting ſeveral diſorders, that are in a great meaſure confined to the negroes, in that part of the world. A better hiſtory of them would enlarge our knowledge of pathology, and teach us, I doubt not, many new and intereſting facts in the animal œconomy. It is much to be regretted, that a work of this kind is not attempted by ſome of the profeſſion in Jamaica or our other Weſt India iſlands, in which there are many men of obſervation every way equal to ſuch an undertaking.

The *yaws* is perhaps one of the moſt remarkable diſeaſes, that prevail among negroes.

It is infectious, and, like the ſmall-pox, never attacks a perſon a ſecond time. It is communicated by contact, moſt commonly in the ſame way that the venereal diſeaſe is; for it is ſeldom caught without ſome cloſe connection, or intimate communication. It is diſtinguiſhed by numerous ſuperficial ſores of no great ſize, in each of which are ſmall ſpherical prominences, in appearance like a raſpberry. There is general ſoreneſs, and laſſitude at their firſt eruption, but no fever. The diſcharge from the ſores is more of a ſlimy mucus than matter. The length of the diſeaſe is various, extending from four or five, to fifteen or twenty months. If a negro, that has contracted the diſorder, be put in circumſtances favourable to general health; if he be not obliged to work, if he be allowed a good diet, and if he be kept clean by frequent waſhings, it will run its courſe, and after a time entirely diſappear. We are not acquainted with any means of eradicating the poiſon, for though mercurials will put an entire ſtop to the diſeaſe, nay remove every morbid appearance, yet it is only for a time: the diſeaſe is ſuſpended, not ſubdued, and it ſoon recurs again. It is the opinion of ſome, that there is much danger from thus interrupting the courſe of the diſeaſe by mercury, and that it becomes afterwards more obſtinate and productive of new diſorders, as violent pains, known under the name of the *bone-ach*. Some admit the uſe of mercury, provided it be not early in the diſeaſe, and ſay that the diſorder does not then return. The period of the diſeaſe, when it can be given with benefit, is not aſcertained with any degree of preciſion.

Reſpecting this diſeaſe there are many *deſiderata*; we are unacquainted with the local effects of the poiſon when it is firſt applied, and alſo with the interval of time, between the application and the firſt appearance of the diſeaſe upon the ſkin. Both thoſe points would be aſcertained by inoculation, a practice which has been propoſed, and appears to be well deſerving of a trial, in this diſorder. It would be of great conſequence to aſcertain, the earlieſt period at which mercury might be given with advantage. The bone-ach, and other diſorders, the effects either real or ſuppoſed of the yaws, are undeſcribed. Theſe are ſome of the moſt obvious heads of inquiry on this ſubject.

The yaws is a diſorder not peculiar to negroes, for ſeveral of the ſoldiers were affected with it.

Cacabay is a negro name for a diſeaſe not known among Europeans or their deſcendants, as far as I could learn. It begins in whitiſh ſpots upon the ſkin, near the ends of the extremities. Thoſe ſpots turn to ulcers commonly upon the fingers and toes; there is much ſwelling with pain, and the joint affected drops off, without any mortification. The ſore afterwards heals up, and remains well even for months; but returns again, affects the next joint, which after a time drops off; and the diſeaſe, attacking one joint after another, in the end reduces the miſerable ſufferer to a mere trunk. It continues often ſeveral years before it prove fatal.

No remedy has been found either to cure it, or much retard its progreſs. Mercurials have been tried, but with little or no advantage. It were greatly to be wiſhed, that the ſymptoms of a diſeaſe ſo formidable and ſo ſingular, were detailed at full length.

The laſt diſeaſe I ſhall mention is no leſs ſingular than either of the preceding, and much more frequent and deſtructive. It appears to be more a diſorder of the mind than of the body, and ſhews itſelf by a very uncommon depravity of the appetite in *eating dirt*. *Dirt-eaters*, as they are called, can ſeldom or ever be corrected of this unnatural practice, for their attachment to it is greater, than even that of dram-drinkers to their pernicious liquor. They have a predilection for particular kinds of earth at firſt, but in the end will eat plaſter from the walls, or duſt collected from the floor, when they can come at no other. They are fondeſt of a kind of white clay, like tobacco-pipe-clay, with which they fill their mouths, and allow it to diſſolve gradually; and expreſs as much ſatisfaction from it, as the greateſt lover of tobacco could do. This practice is common at all ages, even almoſt as ſoon as they leave the breaſt, the young learning it from the old.

Beſides the pleaſure they have in this practice after it has become habitual, they are ſuppoſed to give into it at firſt from other motives, ſuch as diſcontent with their preſent ſituation, and a deſire of death in order to return to their own country, for they are well aware that it will infallibly deſtroy them. It is ſuppoſed, that a diſeaſed ſtate of the ſtomach may give riſe to the depraved appetite, but of this there is no good evidence; and as was obſerved before, it appears to be more a diſeaſe of the mind than of the body. Whatever the motives may be that induce them to begin the practice, it ſoon proves fatal if carried to great exceſs. There are inſtances of their killing themſelves in ten days, but this is uncommon; and they often drag on a miſerable exiſtence for ſeveral months, or even one or two years. The ſymptoms that it induces are thoſe of a dropſy; the appetite fails, the face becomes bloated, the extremities ſwell, and effuſions of water take place under the ſkin, and in all the cavities of the body.

On examining the body after death, there are frequently found in the colon large concretions of the earthy matter, which they have ſwallowed, lining the cavity of the gut, and almoſt completely obſtructing the paſſage. The meſſenteric glands are always ſwelled. The blood is thin, and with few red globules, as is common in dropſies; and there are large *polypi* in the left ventricle of the heart, and in the aorta. They are very ſtrong and firm, and pulled out give the repreſentation of an injection of the aorta, ſubclavian, and carotid arteries. In order to aſcertain, whether they were formed before or after death, the body has been opened a few minutes after the patient expired, and they have been found already ſtrong and firm *. They are no doubt formed, when the motion of the heart becomes feeble and languid, juſt before death.

No means of preventing the horrid practice of *eating dirt*, as it is called, nor any method of remedying the deſtructive effects of it, have hitherto been diſcovered: a negro labouring under the malady is conſidered as loſt. On many eſtates, half the number of the deaths, on a moderate computation, are owing to this cauſe. They are not to be deterred from it by ſtripes, promiſes, or threats; nor have ſtomachic medicines, magneſia and abſorbents, or a good and full diet ever done much good. What could not be effected by any of the means juſt mentioned, has been in part accompliſhed upon ſome eſtates, as I have been informed, by cutting off the heads from the dead bodies of thoſe, who have died of this vicious practice. The negroes have the utmoſt horror and dread of their bodies being treated in this manner, and the efficacy of this expedient, which can only operate upon the mind, is a ſtrong proof, that the diſeaſe in its origin is more a mental than a corporeal affection.

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* The obſervations made upon the dead body were communicated to me by Dr. Thomas Clarke, botaniſt of the iſland of Jamaica.

CHAP. IX.

Of the beſt Manner of taking Care of the Sick of Armies in Jamaica, and our other Weſt Indian Iſlands.

FROM what has been ſaid in the foregoing pages, it muſt appear that the far greater part of the diſeaſes, to which ſoldiers are ſubject in the Weſt Indies, are of ſuch a nature as to require immediate care, and attention. Time loſt in procuring admiſſion into a general hoſpital is irretrievable. It is ſtill worſe if the hoſpital be at a diſtance, and the ſick are to be ſent to it; for beſides the delay, they are expoſed to fatigue, which never fails greatly to aggravate the diſeaſe; and both together diminiſh in an high degree the chance of recovery. Wherever ſoldiers are, there alſo ſhould be the means of taking care of the ſick; not only every regiment, but every detachment, ſhould have an hoſpital. Were the troops to be placed in the healthy quarters already pointed out, as it would greatly reduce the number of ſick, ſo it would be productive of conſiderable ſavings both in the quantity of medicines, and in the number of attendants; but till that be done, we muſt conſider them as remaining in their preſent ſituation, and requiring ſuitable proviſion. The obſervations I have to make may be arranged under the heads of *attendance*, *medicines and hoſpital ſtores*, and *ſubſiſtence*.

There has been occaſion to obſerve, in examining the returns of the ſick, that it is no uncommon thing for their number to amount to one third of the whole, and therefore proviſion ſhould be made for that proportion. Fifty ſick, ſuppoſing fifteen or twenty of them to be convaleſcents, are as many as one perſon, whether a regimental ſurgeon or mate, or an hoſpital mate, can take care of; and if the proportion of fevers and fluxes among the ſick, and the cloſe attention they require be adverted to, it muſt be allowed that one perſon ſhould be poſſeſſed both of diligence and aſſiduity, to do juſtice to that number. At that rate, therefore, there ought to be a ſurgeon to every 150 men. As there is ſometimes more ſickneſs in one regiment than another, it is for the good of the ſervice to have the aſſiſtant ſurgeons upon the ſtaff eſtabliſhment, and not attached to any particular corps, that they may be moved more readily from place to place, as the number of the ſick may require. A ſurgeon, that would do juſtice to the men under his care, muſt be very frequent in his viſits to the hoſpital; for unleſs he watch aſſiduouſly the remiſſions of the fever, and be ready to take immediate advantage of them, he will not be able to check the diſeaſe ſpeedily, without which both the conſtitution and life of the patient will be in imminent danger. A man that has three or four fits of the fever, is in greater danger of dying, than one that has only one or two: but laying the riſk of death out of the queſtion, a man that has his fever ſtopped after the firſt or ſecond fit, will generally be reſtored to health in a few days, whereas if he have four or five fits, it will often require as many weeks to recover the ſame degree of ſtrength in the latter caſe, as days in the former.

It muſt therefore be obvious, how much the diligence and attention of the ſurgeon importeth; of which a very ſtriking proof occurred in the firſt battalion of the 60th regiment, which conſiſted of twelve companies. The regiment was provided with two hoſpitals and two ſurgeons, each of whom took charge of the ſick of ſix companies. It was preſently found that one hoſpital was much fuller than the other, which did not appear to proceed from a greater ſickneſs among one diviſion of the companies than the other, for there was no material difference in the number of ſick ſent from the ſeveral companies. In order to bring the ſick in the two hoſpitals to an equality, a company was taken from one diviſion and annexed to the other. The ſick of the five companies were, however, ſtill more numerous than that of the ſeven; and after a ſhort trial, they were divided into four and eight companies, and then the ſick in the two hoſpitals were nearly equal, and varied from forty to ſixty in each. It may be ſuppoſed, that ſo great a difference depended upon the method of treatment being entirely different in the two hoſpitals. That however was not the caſe; the general plan of treatment was nearly the ſame in both, and not materially different from what has been mentioned in ſpeaking of the cure of the remittent fever *. It was owing to the following circumſtances: one ſurgeon viſited his hoſpital four or five times a day, the other only twice a day; the firſt ſeldom allowed any remiſſion to paſs without taking advantage of it, the latter often; one was always at hand to palliate the untoward ſymptoms, as vomitings, or purgings, proceeding either from the medicines or the diſeaſe; the other, not. Add to theſe, that vigilance in the ſurgeon at the head of an hoſpital extends itſelf to the ſervants, and nurſes under him, and thence a greater degree of attention, both in adminiſtering nouriſhment and medicines. The effect of all thoſe cauſes was, that the men recovered in half the time in one hoſpital that they did in the other, and therefore the hoſpital for eight companies had no greater number of ſick, than that for four.

A book was kept in every hoſpital, in which was entered the name of each patient, his age, the time of his admiſſion, the diſeaſe under which he laboured, and the medicines which were daily given to him. This was found equally uſeful and convenient to the ſurgeons,

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* This appeared from the medicines entered in the hoſpital book, to be taken notice of afterwards.

and to the phyſician or inſpector of the hoſpitals: and from this book a weekly return was made of the ſick admitted, diſcharged, and remaining in the hoſpital.

I cannot help ſuggeſting that an hoſpital book or regiſter, kept in the manner recommended, in each regiment, and on board every ſhip of war, would afford the beſt proofs of the diligence and abilities of the ſurgeons; and if annually tranſmitted to thoſe, to whoſe ſuperintendance the care of the health of the navy and army is committed, would have the good effect of making induſtry and abilities known at the greateſt diſtance. A plan of this kind would greatly contribute to improve our knowledge of diſeaſes, in all the various climates to which the poſſeſſions of the Britiſh empire extend; and, by enabling us to take better care of the health of our ſeamen and ſoldiers, might prove a national benefit.

The ſubſiſtence of the ſick in *general hoſpitals* has always been found extremely expenſive, yet on actual ſervice they appear to be indiſpenſable. In our Weſt India iſlands they are not only unneceſſary, but would be pernicious to the troops in garriſon; and the uſe of them was diſcontinued in Jamaica, by directions from the inſpector general of hoſpitals, with the beſt effect.

The mode of ſubſiſting the ſick, in regimental hoſpitals, muſt vary according to local circumſtances; in Jamaica it was ordered ſo, that while juſtice was done to the ſick, they were hardly a greater expence to government than the men who were well. Of the *rations* or proviſions iſſued to the ſoldiers, bread only was given to the ſick. In the room of the ſalt meat, rum, and other articles, they had five ſhillings *currency** a week, which was the value that the commiſſaries put upon them, and which they paid weekly in lieu of the proviſions. To the ſum of five ſhillings per week was added one ſhilling and eight pence currency, out of the ſoldiers pay. The ſubſiſtence of the ſick therefore conſiſted of the uſual allowance of bread, and ſix ſhillings and eight pence currency per week. This money was laid out in purchaſing freſh meat, vegetables, coffee, ſugar, milk, and other articles neceſſary for the ſick. It was amply ſufficient for all thoſe purpoſes, and even for the payment of *orderly* men, who acted as nurſes;

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* Five pounds ſterling are equal to ſeven pounds currency.

for there were few or no female nurſes in any of the hoſpitals; they ruined their health by drinking, and could not be depended upon ſo much as the men. An account of the money above ſpecified was kept in a book in the hoſpital, open to the inſpection of the officers of the regiment, and of the phyſician or inſpector of the hoſpitals. The ſubſiſtence of the ſick ſo far coſt government no more than that of the men in health; but it was neceſſary to allow wine as a medicine, and that in conſiderable quantities; wine therefore and medicines were the only extraordinary hoſpital expences. For the purchaſe of wine ample proviſion was made by the iſland: and it ought to be mentioned, that the GENERAL ASSEMBLY of Jamaica, both in this and in every thing elſe appertaining to the accommodation of the troops, ſhewed at all times a moſt laudable diſpoſition to make the greateſt exertions.

Beſides medicines and wine it was neceſſary to have among hoſpital ſtores, bedding, cooking utenſils, and ſeveral other articles that are wanted in furniſhing an hoſpital; for ſoldiers are allowed no bedding in the Weſt Indies, and generally have none except a blanket.

Medicines muſt neceſſarily be provided by government in that country, for what is called the medicine money of a ſurgeon, would not purchaſe one twentieth part of the requiſite articles. Bark alone would coſt ſome hundred pounds; it is often ſold in the country for three pounds currency *per pound*, and at a moderate computation, one pound annually is neceſſary for each man. From this article alone a judgment may be formed, how much it is beyond the power either of a ſurgeon of a ſhip of war, or of a regiment, to furniſh medicines for the men in that country; and unleſs government interpoſe, the ſick muſt remain deſtitute of many things, that are often indiſpenſably neceſſary for their preſervation. Ample proviſion has always been made for the army, and why equal care ſhould not be taken of our brave ſeamen, it will be difficult to aſſign any good reaſon.

It has been an object of principal conſideration, in allowing medicines to the army, to prevent the abuſe of them. The high value, which they bear in thoſe countries, has been believed in ſome caſes to prove a temptation to thoſe, through whoſe hands they paſſed. It is an eaſy matter to eſtabliſh proper checks upon the expenditure of medicines, and it was done in this manner. An exact ſtate of the medicines, wine, and other articles in ſtore, was taken; and the ſtore-keeper, purveyor, or other perſon having charge of them, was directed to iſſue none without a written order from the phyſician, inſpector of hoſpitals, or one having authority to give ſuch orders. Thoſe orders, with a receipt upon them from the ſurgeon of the regiment, or perſon in whoſe favour they were granted, were vouchers to the ſtorekeeper. By theſe means, no abuſes could exiſt without detection; and that they might more eaſily appear upon the face of the account, a quarterly return of the expenditure of medicines was regularly made. The orders for medicines are neceſſarily granted by a perſon, whether phyſician, or inſpector, who ſuperintends the care of the ſick in general, and to whom the weekly returns of the ſick in hoſpital are made. He will therefore at all times be a judge of the quantities of medicines neceſſary for particular regiments or detachments, as the ſtate of their ſick muſt be known to him. If any abuſes are ſuſpected to take place, after the medicines come into the hands of the ſurgeons, or others

having

having charge of the ſick, it is an eaſy matter to aſcertain what grounds there are for ſuch ſuſpicions, by examining the hoſpital book, in which is an account of all medicines ordered for the ſick. I ſhould treſpaſs on the patience of my reader, to enter farther in detail upon this ſubject, where it muſt be obvious, that the means of preventing, or detecting abuſes, are equally ſimple and effectual.

In conſequence of the men being rendered unfit for ſervice, by repeated attacks of fever, flux, dry-belly-ach, and by ſores, the number of invalids accumulated daily in the hoſpitals, and in the regiments. Humanity as well as the intereſt of government required, that ſuch ſhould be ſent home from time to time. While they remained in the iſland they were a burden upon the army, without any chance of their ever being uſeful; but upon being ſent to a cooler and more healthy climate, many of them recovered; particularly thoſe who were broken down by fevers, or laboured under ſores.

APPENDIX.

OBSERVATIONS ON THE HEAT OF WELLS AND SPRINGS IN THE ISLAND OF JAMAICA, AND ON THE TEMPERATURE OF THE EARTH BELOW THE SURFACE IN DIFFERENT CLIMATES.

Read at the ROYAL SOCIETY, Dec. 20, 1787.

TO THE HON. MR. CAVENDISH.

SIR,

THE following obſervations on the heat of ſprings and wells, and their application towards determining the mean temperature of the earth in different climates, were ſuggeſted by you in ſome converſation on that ſubject, previous to my going to Jamaica in 1780. If you think them deſerving the attention of the Royal Society, I muſt beg the favour of you to lay them before that learned Body.

I have the honour to be, &c.

JOHN HUNTER.

Charles-ſtreet,
Dec. 11, 1787.

THE great difference between the temperature of the open air, and that of deep caverns or mines, has long been taken notice of, both as matter of curioſity and ſurprize. After thermometers were brought to a tolerable degree of perfection, and meteorological regiſters were kept with accuracy, it became a problem, to determine what the cauſe was of this difference between the heat of the air, and the heat of the earth; for it was ſoon found, that the temperature of mines and caverns did not depend upon any thing peculiar to them; but that a certain depth under ground, whether in a cave, a mine, or a well, was ſufficient to produce a very ſenſible difference in the heat. In obſervations of this kind, there was perhaps nothing more ſtriking, than that the heat in ſuch caves was nearly the ſame in ſummer and winter; and this even in changeable climates, that admitted of great variation between the extremes of heat in ſummer, and cold in winter. There is an example of this in the cave of the Royal Obſervatory at Paris. The explanations, which have been attempted of this phænomenon, have turned chiefly upon a ſuppoſition, that there was an internal ſource of heat in the earth itſelf, totally independent of the influence of the ſun*. M. DE MAIRAN has beſtowed much labour on this ſubject, and by obſervation and calculation is led to conclude, that of the 1026° of heat (by REAUMUR's ſcale), which he finds to be the heat of ſummer at Paris, 34°,02 only proceed from the ſun, and the remaining 991°,98 from the earth, by emanations of heat from the center†. The proportion therefore of heat derived from this latter ſource is to that of the ſun, as 29,16 to 1. It muſt be evident, that an hypotheſis of this kind, which renders the influence of the ſun of ſmall account, is directly contrary to the general experience and conviction of mankind. Without entering, however, into any diſcuſſion at preſent of the *data* from which M. DE MAIRAN draws his concluſions, it will be more ſatisfactory to conſider what the effect of the operation of thoſe laws of heat, with which we are acquainted, would be.

And firſt, it is well known, that heat in all bodies has a tendency to diffuſe itſelf equally through every part of them, till they become of the ſame temperature. Again, bodies of a large maſs are both cooled and heated ſlowly. Beſides the maſs of matter, there are two other conſiderations of much importance in the ſlow or quick tranſmiſſion of heat through bodies; theſe are their different conducting powers, and their being in a ſtate of ſolidity or fluidity. The conducting powers of heat are well known to be very various in different bodies; nor are they hitherto reducible to any law, depending either upon the denſity, or chemical properties of matter. Metals of all kinds are good conductors of heat, while glaſs, an heavy, ſolid, homogeneous body, is an extremely bad conductor, even when a metallic calx enters largely into its compoſition, as in flint glaſs. A ſtate of fluidity greatly promotes the diffuſion of heat; for a body in a fluid ſtate, by the particles moving readily among each other from their different denſities or other cauſes, has the warm and cold parts mixed together, which occaſions a quick communication of heat. To apply theſe obſervations to the preſent ſubject; the ſurface of the earth being expoſed to the great heats of ſummer, and the colds of winter, or more properly the low degree of heat of winter, will receive a larger proportion of heat in the former ſeaſon, and a ſmaller in the latter; and being further of a large maſs, and of a porous and ſpongy ſubſtance, and therefore not quickly ſenſible to ſmall variations of heat, it will become of a mean temperature at a certain depth, between the heat of ſummer, and the cold of winter, provided it contain no internal ſource of heat within itſelf. This concluſion is ſtrictly agreeable to the experiments and obſervations hitherto made, in heating and cooling bodies, or in mixing portions of matter of the ſame kind of different temperatures *. Water, though in a large maſs, follows in ſome degree the heat and cold of our ſummer and winter, from the mobility of its parts occaſioning a more ſpeedy diffuſion of heat. Air is quickly ſuſceptible of heat, and from the expanſions produced in it, and conſequent motions in the whole maſs, the temperature is ſoon rendered uniform.

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* Vid. Martine's Eſſays, p. 319.

† Memoir. de l'Acad. des Sciences, An. 1719 et 1765.

The changes in the heat of the air are what we have meaſured, and we are to be underſtood to ſpeak of them, when we talk of the tempe-

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* Vid. De Luc Modifications de l'Atmoſphere, Vol. I. p. 285.

temperature of ſummer and of winter. It may be aſked then, is the heat of the ſun firſt communicated to the air, and thereby to the earth? No, the air is ſuſceptible of a very ſmall degree of heat from the rays of the ſun paſſing through it; for it is well known, they produce no heat in a tranſparent medium, and conſequently, that the air is only ſo far heated as it differs from a medium that is perfectly tranſparent. The heat produced by the rays of the ſun bears a proportion to their number, their duration, and their falling more or leſs perpendicularly; and it takes place at the points where they ſtrike an opaque and non-reflecting ſurface. The ſurface of the earth may therefore be conſidered as the place, from whence the heat proceeds, which is communicated to the air above, and the earth below. That this is really the caſe is evident from the ſuperior degree of heat, produced by the action of the rays of the ſun upon an opaque body, which will often be heated to 150° (FAHRENHEIT), while the temperature of the air is not above 90°*. It may ſeem, therefore, that to meaſure the heat communicated to the earth, it ſhould be done at the ſurface, where the action of the rays immediately takes place. But though the heat be produced at the ſurface, it is communicated freely to the air as well as the earth; and though the apparent intenſity of heat be greater in the earth, from the rays of light acting for a longer time upon the ſame parts of matter, yet there is little doubt that much the greater part is carried off by the air, which as it is heated flies off, and allows a freſh portion of cold air to come in contact with the heated ſurface. But ſtill it is immaterial, whether the heat of the ſun be excited more in the earth or in the air; for whichever has the larger proportion will in the end communicate a part to the other, and ſo reſtore the balance. The ſame obſervation applies to ſuch cauſes of cold as may operate at the ſurface of the earth, as evaporation, and that taken notice of by Mr. WILSON*. The air, therefore, near the ſurface of the earth will ſhew by a thermometer in the ſhade nearly, if not exactly, the ſame degree of heat that the ſun communicates to our terreſtrial globe; and if a mean of the heats thus ſhewn be taken for the year round, and we penetrate into the earth to that depth, that it is no longer affected either by the daily, monthly, or annual variations of heat, the temperature at ſuch depth ſhould be equal to the annual mean above mentioned. To aſcertain this with the utmoſt preciſion, it muſt be obvious, that numerous obſervations ſhould be made every day, correſponding to the frequent changes of temperature, which are known to happen in the courſe of the twenty-four hours in all climates; and upon theſe a daily mean ſhould be taken, and the annual mean deduced therefrom. This has not yet been done, but where we have obſervations from which a mean temperature can be deduced with any degree of certainty, it will be found not to differ greatly from the heat of deep caves, or wells in the ſame climate. If further experience and obſervation ſhould confirm the above opinions, it will be attended with this advantage, that we ſhall be poſſeſſed of an eaſy and ready method of aſcertaining the mean temperature of any climate; which, with a few obſervations of the extremes of heat and cold at particular ſeaſons, will teach us as much of the country, with regard to heat and cold, as the meteorological obſervations of ſeveral years.

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* Martine's Eſſays, p. 309.

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* Vid. Phil. Tranſ. Vol. LXX. p. 451. and Vol. LXXI. p. 386.

For obtaining the temperature of the earth the beſt obſervations are probably to be collected from wells of a conſiderable depth, and in which there is not much water. Springs iſſuing from the earth, although indicating the temperature of the ground from whence they proceed, are not ſo much to be depended upon as wells; for the courſe of the ſpring may be derived from high grounds in the neighbourhood, and it will thence be colder; it may run ſo near the ſurface as to be liable to variations of heat and cold from ſummer and winter; or it may be expoſed to local cauſes of heat in the bowels of the earth. Wells ſeem alſo better than deep caverns, for the apertures to ſuch are often large, and may admit enough of the external air to occaſion ſome change in their temperature. Wells are not, however, to be met with in all places, and in that caſe we muſt remain ſatisfied with the temperature of the ſprings.

The following obſervations were made in the iſland of Jamaica, where there are flat lands in many parts towards the coaſt, but all the interior part of the country is mountainous.

ous. The heat is greateſt in the low lands, and decreaſes as you aſcend the mountains. The town of Kingſton is ſupplied with water from wells. The ground on which it ſtands riſes with a gentle aſcent as you recede from the ſea. In the low part of the town the wells are but a few feet deep, and many of them brackiſh. The heat of the water in ſome of them I have found as high as 82°; but they were evidently too near the ſurface not to be affected by the heat of the ſeaſons. As you aſcend, the wells are deeper, and the temperature is nearly 80° in all of them. What variations there are, come within one degree, that is, half a degree leſs than 80°, or half a degree more. They are of different depths, and ſome not leſs than 100 feet; though, after they are of half that depth, the temperature is nearly uniform. At the *Governor's Pen*, which is alſo in the low part of the country, a well, which is above 60 feet deep, is 79½°. There is a well at Half-way-Tree, 243 feet deep, which is 79°. Half-way-Tree is two miles from Kingſton, with a very gentle aſcent. Near Rock-Fort is a ſpring, immediately at the foot of the long mountain, which throws out a great body of water; the heat of it is 79°. All the places mentioned are but very little above the level of the ſea, probably not more than the depth of the wells at the reſpective places; for near Kingſton there are ſprings that appear juſt below the water-mark of the ſea, and thoſe that ſupply the wells are probably upon the ſame level.

The temperature of the air at Kingſton admits but of ſmall variation. The thermometer, at the hotteſt time of the day, and during the hotteſt ſeaſon of the year, ranges from 85° to 90°; in the cooleſt ſeaſon, and obſerved about ſun-riſe, which is the coldeſt time in the twenty-four hours, it ranges from 70° to 77°. I have ſeen it once as low as 69°, and two different times as high as 91°. The annual mean temperature cannot, therefore, either much exceed, or fall much ſhort of, 80°, as indicated by the wells.

The following ſprings were examined with much accuracy by the Hon. Mr. SEWELL, Attorney General of the iſland.

Ayſcough's ſpring, on the road from Spaniſh Town to Puſey's, in St. John's pariſh, 75°.

Puſey's ſpring, ſtill higher in the mountains, 72°¾.

A ſpring near the barracks at Points Hill in St. John's pariſh, 70°.

The thermometer in the ſhade at Puſey's, during part of the month of June, was found to range from 69°½ to 79°½. It was obſerved both late at night, and early in the morning before ſun-riſe.

The ſpring in Brailsford Valley, about ten miles above Spaniſh Town, is 75°. The ſpring at Stoney Hill is 71°. Theſe were examined by Mr. Home.

Mr. Wallen's houſe, at Cold Spring, ſtands the higheſt of any in the iſland. By a meaſurement, ſaid to have been made by Mr. M'Farlane, it is reported to be 1400 yards above the level of the ſea. On the road to it, and about a mile below Mr. Wallen's houſe, there is a ſpring that iſſues from the ſide of the hill, of the temperature of 65°. Cold Spring, which gives a name to the place, is about fifty feet below the houſe, and the heat of it is 61°¾. The thermometer in the ſhade at Mr. Wallen's houſe, for ſome days in the month of April, ranged from 57° to 67°. It may be remarked, that the higher the ſprings the colder they are; and, as far as a conjecture can be formed from ſo few obſervations, they would appear not to differ much from the mean temperature of their reſpective places *.

It will not be out of place to add ſome obſervations made in England, relative to the ſame ſubject. The wells in and about London are either of no great depth, or are full of water, which are both conſiderable objections to their giving a mean temperature. The want of depth will make them ſubject to the variations of the ſeaſons; and a large quantity of water, even in a deep well, will take the temperature of the air more or leſs: for any change of temperature communicated at the ſurface will, from the fluidity of the water, be readily diffuſed through the whole. I ſuſpect it is owing to this cauſe, that the wells in the neighbourhood of Brighthelmſtone vary from 50° to 52°, for thoſe were the higheſt that had moſt water in them. My obſervations were made in ſummer. Theſe wells are of various depths, from 15 to 150 feet. That which I always found the coldeſt is not more

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* The thermometers made uſe of were all made by Mr. RAMSDEN.

than 22 feet deep; I never found its heat greater than 50°. It is near the beach, and is a tide well, that is, the water in it riſes and falls, and in ſo doing does not correſpond exactly with the tides, but follows them with an interval of about three hours. At the loweſt there is not more than a foot of water in it; and it may be conſidered as a ſubterraneous ſpring running through the bottom of the well. There are in fact numerous ſprings that break out upon the ſand, a few feet above the low-water mark, which are doubtleſs the ſame that ſupply the wells. As we are not acquainted with any cauſe that produces cold in the bowels of the earth, we muſt neceſſarily, in every climate, conſider the loweſt degree of heat as approaching neareſt to the mean temperature; and therefore we cannot conclude the mean temperature at Brighthelmſtone to be more than 50°. The mean temperature of London is computed about 52°*; but Brighthelmſtone is nearly fifty miles farther ſouth than London, and is immediately upon the ſea, and muſt therefore be at leaſt as warm as London. It is evident, that the obſervations from which the mean is taken, muſt generally contain more of the extremes of heat than of cold, as the former happen in the day-time, and the latter in the night, in conſequence of which they will often eſcape notice. There is a table conſtructed by Dr. HEBERDEN *, expreſſing the heat in London for every month in the year, from a mean of ten years beginning with 1763, and ending with 1772. The mean temperature is given both at 8 A.M. and 2 P.M. There is further in the table, a column of the mean of the greateſt monthly colds in the night, obſerved during the ſame ten years by Lord CHARLES CAVENDISH, in Marlborough-ſtreet. There will not probably be any great error in conſidering the heat obſerved at 2 P.M. as the greateſt daily heat; and taking a mean between the greateſt heats of the day, and greateſt colds of the night, they give 49°,196 for an annual mean, which is much lower than is commonly ſuppoſed. At the houſe of GEORGE GLENNY, Eſq. near Bromley, there is a well ſeventy-five feet deep, which I found in November 49½°. M. DE MAIRAN has given a table of the greateſt heats and greateſt colds obſerved at Paris for

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* Kirwan's Temperature of different Latitudes, p. 73.

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* The table alluded to follows this Paper.

fifty-ſix years, beginning from 1701; and a mean of them is 10° above freezing, or 1010°, of REAUMUR's ſcale*. The temperature of the cave of the Obſervatory where thoſe obſervations were made, is 10°¼ above freezing, by the ſame ſcale of REAUMUR. There appears not therefore any neceſſity for an internal heat; on the contrary, it is matter of demonſtration, that were there any ſource of heat in the earth which was not equally in the air, the heat of the interior parts ought to be higher than a mean: and did the *central heat* bear as high a proportion to that of the ſun as M. DE MAIRAN alledges, the heat of the earth itſelf ought to be a great deal above the mean temperature of the air, which from obſervation there is no ground for believing. It is eaſy to ſee the ſource of M. DE MAIRAN's error; he has founded his calculations upon the ſcale of REAUMUR, and conſiders the degrees of his thermometer as marking the real proportions, and abſolute quantity of heat †. It is a matter that cannot be denied, that we know nothing of the abſolute quantities of heat; and that the degrees of our thermometers are only to be conſidered as a few of the middle links of a chain, the length of which we are totally ignorant of, and therefore in no condition to compare its proportional parts. It deſerves, however, to be remarked, that obſervations of a late date have ſhewn, that the notions of cold upon which REAUMUR's ſcale was conſtructed, and upon which M. DE MAIRAN's calculations are founded, are imaginary and without foundation *.

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* Mem. de l'Acad. des Sciences, An. 1765, p. 202.

† Ibid. p. 143.

Hot ſprings and volcanos may be produced as proofs of the exiſtence of an internal ſource of heat in the earth; but their operation appears to be limited to a very ſmall extent, and ſcarcely deſerving of notice in the preſent diſcuſſion. It is no uncommon thing to find ſprings of the uſual temperature cloſe by hot ſprings; and no volcano, with which we are yet acquainted, appears to have raiſed the temperature of the country immediately adjoining to it.

The ſea admits of change of temperature more quickly than the earth, particularly near the ſhore. The mean heat of the ſea

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* Vid. Phil. Tranſ. Vol. LXXIII. p.*303. 303 and 329.

at Brighthelmſtone, during the months of July, Auguſt, September, and October, was as follows:

July	63°$\frac{1}{7}$
Auguſt	63°$\frac{1}{2}$
September	58°
October	53°

The obſervations were made with a view to aſcertain the temperature of the ſea as a bath, and therefore the heat was taken about nine in the morning, and near the ſhore, the uſual time and place of bathing. The water gets hotter towards three o'clock in the afternoon, ſo that it not only follows the monthly, but even the daily changes of the temperature of the air. In the four months juſt mentioned, the extremes of heat and cold are conſiderable: I have ſeen it as hot as 71°, and as cold as 49°. In the month of Auguſt laſt, Sir HENRY ENGLEFIELD examined the heat of the ſea at the ſame time that I did, and we both found it 71°: it was about 4 P.M. of a very hot day. I may be allowed to remark, that ſea-bathing is a very different thing at different ſeaſons of the year, and requires an acquaintance with the variations of the temperature, to adapt it to particular caſes.

It were to be wiſhed, that the heat of wells and ſprings were examined at different ſeaſons of the year, in order to aſcertain the effect of ſummer and of winter upon them. The wells at New York are from 32 to 40 feet in depth, and Dr. NOOTH found them to have an annual variation of two degrees from 54° to 56°. There are few countries, in which the annual range of the thermometer is greater than at New York, and the neighbouring parts of America. In the ſummer it is often as high as 96°, and in winter it has been obſerved ſeveral degrees below the zero of FAHRENHEIT's ſcale.

We may, I think, from all the obſervations we are yet in poſſeſſion of, conclude, that there is at preſent no ſource of heat in the earth, capable of affecting the temperature of a country, which is not derived from the ſun; and that the earth, whatever changes of temperature it may be conjectured to have undergone in former periods, is now reduced to a mean of the heat produced by the ſun in different ſeaſons, and in different climates.

A Table of the mean Heat of every Month for Ten Years in London, *from* 1763 *to* 1772 *incluſively. By* William Heberden, *M.D. F.R.S. and A.S.*

Read at the ROYAL SOCIETY, Jan. 31, 1787.

		At 8 A.M.	At 2 P.M.	Mean.	Night.
		°	°	°	°
12	January	35	39	37	34.7
10	February	38	43	40.5	36.6
9	March	39	45	42	37.1
7	April	44	52	48	41.3
5	May	51	59	55	46.4
3	June	57	65	61	52.4
2	July	59	68	63.5	55.6
1	Auguſt	60	68	64	55.1
4	September	55	63	59	51.7
6	October	48	55	51.5	45.5
8	November	43	48	45.5	40
11	December	39	42	40.5	37.3

EXPLANATION OF THE TABLE.

The firſt column of figures denotes the order of the months according to their degrees of heat, beginning with Auguſt, in which the heat is greateſt.

The ſecond, and third, are the heats marked at the hour expreſſed at the top of each column, and the fourth is the mean between theſe two.

The laſt column is the mean of the greateſt cold at night, obſerved in Marlborough-ſtreet for twenty years, by the late Right Hon. Lord CHARLES CAVENDISH.

Some experiments made upon Rum, in order to aſcertain the cauſe of the Colic, frequent among the ſoldiers in the Iſland of Jamaica, *in the years* 1781 *and* 1782: *by* John Hunter, *M.D. Phyſician to the Army. Communicated by Sir* George Baker.

Read at the COLLEGE, March 16, 1785.

IN the year 1781, a colic, reſembling in all its ſymptoms and conſequences the painter's colic, or *colica Pictonum*, became frequent among the ſoldiers of the 1ſt battalion of the 60th regiment, and thoſe of the 92nd regiment, both of which were quartered in Spaniſh Town. The year following, the 79th regiment, quartered at Kingſton, ſuffered much from the ſame diſeaſe, while other regiments in and about that town felt little or nothing of it, and the troops in Spaniſh Town had it only in ſuch as had been ill before, and relapſed. Every circumſtance reſpecting this diſeaſe, particularly ſuch as might tend to diſcover the cauſe of it, became an object of importance, both on account of the violence of the ſymptoms, and the great number that were ſeized with it. In the 92nd regiment almoſt all the private ſoldiers had one or more fits of the colic, which terminated in not a few in palſies of the extremities. The ſame happened in the 60th and 79th regiments, from both of which, as well as from the 92nd, a conſiderable number of men were diſcharged, that were rendered incapable of ſervice by this diſeaſe; for, though in moſt inſtances, the ſufferers recovered the motion of their limbs, yet they had little or no ſtrength in them, and were ſubject to relapſes. Among the practitioners of medicine in the iſland, different cauſes were aſſigned for this diſeaſe; in general however they might all be reduced to the three following, *bad water*, *acid fruits*, *and bile*. The inhabitants of Spaniſh Town uſed the ſame water as the ſoldiers, both being ſupplied from the river; yet neither they, nor the officers ſuffered from the colic like the private ſoldiers, as they moſt undoubtedly would have done, had the cauſe been in the water. The 79th regiment at Kingſton, were ſupplied with water from a well in their barracks, and while the colic was moſt common among them, they changed their water, but with no advantage. There appears to be no better reaſon for believing the acid fruits to be the cauſe of this diſeaſe. Both they, and the water, ſeem to have fallen under ſuſpicion, from affecting the bowels at times. Impure and brackiſh water will occaſion gripings and purgings in perſons unaccuſtomed to it; large quantities likewiſe of acid fruits are apt to produce the ſame effects, eſpecially when firſt eaten: but in both theſe caſes the affection of the bowels is attended with a looſeneſs; whereas, an obſtinate coſtiveneſs is the moſt characteriſtic ſymptom of the colic in queſtion. It's attacking one regiment, while another, ſimilarly ſituated, almoſt intirely eſcaped it; and it's prevailing among the ſoldiers in Spaniſh Town at one time, and in Kingſton at another, while in both places the officers and better ſort of people ſuffered not at all; are further proofs that it is not to be imputed to any common cauſe, as the air, or water. The only ground upon which bile was charged with being the cauſe of the colic, was, as far as I could learn, that it was frequently brought up by vomit during the diſeaſe. But this appeared to depend upon the ſickneſs and retchings, the uſual concomitants of the colic; for it is well known that ſtrong vomiting, from whatever cauſe it proceed, will bring up, in almoſt every caſe, large quantities of bile, eſpecially if the vomiting continue ſome time. Bile might with equal juſtice be ſuppoſed to be the cauſe of ſea-ſickneſs as of the colic. The term, like ſome others that we have in phyſic, is too often uſed without meaning, or as a cover to our own ignorance.

There being nothing ſatisfactory in any of the above cauſes, and the ſtrict reſemblance between this diſeaſe and that to which the workers in lead are ſubject, affording a ſtrong preſumption that they were owing to the ſame cauſe, as is obſerved by Sir George Baker, in the Medical Tranſactions; I was led to enquire in what way this poiſonous metal could get into the conſtitution. I examined the utenſils uſed by the Soldiers in cooking, but found no reaſon to ſuſpect them. It being an old eſtabliſhed opinion among the inhabitants of the iſland, that drinking new and bad rum was the cauſe of the colic, I was induced to make the following experiments on two ſpecimens of rum, taken from the barracks of the 60th and 79th regiments.

I put a little of each in a wine glaſs, and added a few drops of the liquor I uſed for a teſt to them. The teſt was prepared by infuſing one part of orpiment, and two parts of quick-lime, in about twelve parts of rain water. The rum in the glaſſes became of a darker colour, and depoſited, after ſome time, a browniſh ſediment. That I might be the leſs liable to deception, in judging of the change of colour, I poured a little of both kinds of rum into two other glaſſes, to which I added none of the teſt, but compared them with the rum to which the teſt had been added, and the change of colour was very evident. I uſed this precaution in all the trials I made afterwards. In one of the glaſſes the colour was darker than in the other; and the *reſiduum*, after the rum was allowed to evaporate, was alſo of a deeper colour.

I was willing to try the effects of mixing pure ſpirits and the teſt together; and therefore added a few drops of it to ſpirits of wine, which in ſtrength is nearly the ſame as Jamaica rum. It produced ſomewhat of a milky appearance, and ſoon after a light-coloured ſediment. The ſpirit being allowed to evaporate, the *reſiduum* was of a light colour.

I took indiſcriminately from a great number, four ſpecimens of different kinds of rum, which had all been made within the eight preceding months. On examining them with the teſt, one was not changed, the other three became all of a darker colour, but of different ſhades. After a little time they depoſited a ſediment, and the rum being allowed to evaporate, the *reſiduum* in the firſt mentioned was whitiſh like that of the ſpirit of wine, in the other three of a dark brown colour, approaching in the worſt to black.

After theſe trials, I could not doubt that there was often a ſlight metallic impregnation in new rum, in whatever way it was produced. With a view to aſcertain how far ſpirits, coming in contact with lead, are able to act upon it, I put two grains of that metal, cut in ſmall bits from a bright ſurface, into two ounces of ſpirit of wine. They remained about ten weeks in a bottle with a glaſs ſtopper, and on adding the teſt to ſome of the ſpirit poured into a glaſs, it became of a dark colour. The ſmall bits of lead had loſt their metallic ſplendor, and part of the metal appeared to have been diſſolved by the ſpirit *.

From the above experiment it would ſeem probable that, in diſtilling rum, the ſpirit may act upon the worm, which is ſpiral and of great length, and made of a compoſition, of which lead ſometimes forms a part. Perhaps this may be the only way in which rum is impregnated with lead; yet, on that ſuppoſition, why is not Britiſh ſpirits equally impregnated with the noxious metal, the ſame kind of worm being uſed in diſtilling both?

In the proceſs of making ſugar, the juice of the canes comes frequently in contact with lead. On running from the mill, it is commonly received into a ciſtern lined with lead, from which a leaden guttering carries it to the boiling houſe. The boilers are of copper, but the bed in which they are ſet is covered with lead, and there is a leaden guttering for conveying the ſkimmings of the liquor to a reſervoir, from which they are taken to make part of the mixture to be fermented for making rum. The leaden gutterings often paſs without cover from the mill to the boiling houſe,

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* The temperature in which the ſpirits and lead ſtood together, was, from 80° to 90° of Fahrenheit's ſcale.

houſe, expoſed to the action of the open air, which is known to corrode lead in ſome degree. The mixture fermented for the purpoſe of making rum is compoſed of ſkimmings or molaſſes, water, and what is called *dunder*, a name given to the liquor that remains in the ſtill after the proceſs of diſtillation. Suppoſing therefore there was an impregnation of lead in the mixture when ſet to ferment, it was a matter I wiſhed to try, whether any of it would riſe with the ſpirit in diſtillation. Not being able, at the time of making the experiments, to procure glaſs or earthen veſſels for diſtilling, I could not ſatisfy myſelf in this particular. I have ſince made the following experiment. I diſſolved ſome *ſaccharum ſaturni* in weak rum, which I knew to be genuine, and diſtilled it in glaſs veſſels. Any impregnation of lead, that may happen to be in the mixture from which rum is diſtilled, muſt be ſimilar to *ſaccharum ſaturni*; and, as the rum is almoſt always diſtilled a ſecond time, I thought the experiment would be more deciſive made with ſpirit, than if the *ſaccharum ſaturni* had been added to a fermenting mixture. The ſpirit which came over, was perfectly free from any impregnation of lead.

This experiment makes it neceſſary to revert to the firſt ſuppoſition, that the impregnation proceeds from the worm. I procured ſeveral ſpecimens of worms, and found ſome of them to contain a conſiderable proportion of lead, as appeared by their ſpecific gravity, and ſoftneſs. Part of an old one, which ſeemed to have as much lead in its compoſition as any I have ſeen, was covered on the inſide with an earthy cruſt, which ſhewed evidently that the ſpirit had acted upon it. I was informed by a reputable manufacturer of worms for diſtilling, that he never uſed any lead himſelf in their compoſition, but made them of pure tin, to which a ſmall proportion of copper had been added, to render the metal tougher, and to make it work better. He added, that he ſometimes had old worms ſent to him, from the Weſt Indies, of a baſe metal. If it be conſidered how much cheaper lead is than tin, and that a mixture of the two metals works better than tin alone, it will not be wondered at, that lead often makes a part of the compoſition. It is well known to diſtillers, that worms made of lead would quickly be corroded by the ſpirit; and it is probable, that, in proportion as that metal enters more or leſs into their compoſition, they will be a ſhorter or a longer time in wearing out. This circumſtance, together with the knowledge of the pernicious effects of lead being of late more univerſally diffuſed, may probably have rendered adulterations of the metal of the worms both leſs frequent, and leſs conſiderable. This may be one reaſon, why the colic is now not near ſo common among the inhabitants of Jamaica as formerly, though the chief cauſe of that happy change is imputed, by the people at large, and I believe with juſtice, to there being much leſs rum drunk now than formerly, and that almoſt always of a good age. A practice however that prevails, of uſing the old worms for ſolder, renders it probable that the adulteration with lead is ſtill not uncommon. Solder is made of a mixture of lead and tin; and I ſuſpect the old worms would ſcarcely anſwer that purpoſe, without lead in their compoſition. In the more precious metals, much care is taken by the eſtabliſhment of aſſay-maſters, and other precautions, that the public may not ſuffer in their property by any adulterations; and it is a pity that equal care were not taken, by ſimilar regulations, that health might not be injured by adulterations in the baſer metals.

The difficulty ſtarted above recurs here; if the impregnation depend upon the worm, why is not home-diſtilled ſpirits equally affected with rum? I am not minutely enough acquainted with all the circumſtances attending the two diſtillations, to be able to ſay poſitively on what ſuch a difference depends. The following particulars, however, may be worth attending to, and may give ſome aſſiſtance towards a ſolution of the queſtion.

To the infuſion of malt, from which the home-diſtilled ſpirit is procured, is added yeſt, for the purpoſe of promoting the fermentation. With the ſame view, the liquor called *dunder*, which is almoſt always more or leſs acid, is added to the mixture from which the rum is to be diſtilled, and will, no doubt, impart a conſiderable degree of acidity to the fermenting liquor. This acidity will be further increaſed, by the fermentation being carried on in a climate, the medium temperature of which is about 80° of Fahrenheit's ſcale, which muſt render it very difficult to prevent the

fermen-

fermentation from running more or leſs into the acetous ſtage. The acid, or vinegar thus produced, will riſe in part with the ſpirit in diſtillation, and act ſtrongly upon any lead that may be in the compoſition of the worm. What I have obſerved of ſome rum, which I know to be unadulterated, would ſeem to put it beyond a doubt, that the acid does riſe with the ſpirit. It is this: expoſe the rum in a glaſs to the open air, and in a ſhort time the ſpirit flies off, and leaves an acid liquor behind. That ſuch an acid would diſſolve ſome part of the lead, provided that metal entered into the compoſition of the worm, can hardly be doubted. The diſtillation of vinegar is directed, in the Edinburgh Pharmacopœia, to be performed in glaſs veſſels; and from neglecting this precaution, I have ſeen the diſtilled vinegar of the ſhops impregnated with metal.

There are two other material circumſtances, in which the malt ſpirit and rum differ. The malt ſpirit undergoes, in general, more diſtillations than the rum, and is kept alſo a longer time before it come to market. The malt ſpirit paſſes from the hands of the malt diſtiller into the rectifier's; whereas the rum is often taken from the ſtill and carried directly to market; and it is this new ſpirit that is peculiarly noxious; for, according to the general opinion of the inhabitants of the iſland, it becomes free from any bad qualities by keeping. The ſequel of my experiments correſponded with this obſervation, for when I came to examine the ſpecimens of rum mentioned above, three or four months after my firſt trials, the teſt produced no change in any of them, except in that which had formerly given the darkeſt colour, but it was not near ſo dark as before. The ſpirit of wine alſo in which the lead had been put, after being poured off the lead about three months, was not affected by the teſt. In this ſpirit, as well as in the ſpecimens of rum, there was a very ſmall blackiſh-coloured ſediment. The greater length of time, therefore, the home-made ſpirit is in coming to market, would help conſiderably to do away any impregnation of lead, ſuppoſing ſuch to exiſt. The good effects of repeated diſtillations will be obvious from the experiment mentioned above, by which it appeared that a ſolution of lead mixed with the ſpirit would not riſe in diſtillation. Rum, in general, is never put oftener than twice through the ſtill; whereas the home-made ſpirit goes frequently three or four times.

Upon the whole, I am inclined to impute the impregnation in the rum, to the worm's being often of a baſer metal than thoſe uſed in the home-diſtillery, to more acid riſing in the diſtillation, to the diſtillations not being repeated ſo often, and to the rum finding its way into immediate uſe. It may be a queſtion, whether the empyreumatic oil which riſes with ſpirits in diſtillation may not have ſome action upon the lead in the worm?

In whatever manner the ſpirit becomes contaminated with lead, it is a fortunate circumſtance, that by keeping it entirely depoſites that metal. What time is neceſſary for this depoſition is not accurately aſcertained; it is probably different as the impregnation is ſtronger or weaker. The common opinion of the inhabitants is, that the rum loſes its noxious qualities in one year. Agreeably to this, the contract made for ſupplying the troops with rum, ſpecified that it ſhould be one year old. There was no reaſon to ſuppoſe that the agreement was not complied with; nor could the ſoldiers, either from the quantity or quality of the rum ſupplied in this way, have ſuffered as they did. What they purchaſed themſelves, at the ſmall retail ſhops, was moſt probably the ſole cauſe of the colic; for there new ſpirits of the worſt quality were ſold, and the ſoldiers liked ſuch the better for being new, as they taſted both hotter and ſtronger. The depoſition of the lead from the ſpirits by keeping, is moſt probably owing to the ſpirit attracting and uniting with the acid that diſſolves the lead, and thereby precipitating the metal. I was led to this opinion by the following experiment. As much *ſaccharum ſaturni* was diſſolved in ſpirit of wine as it would take up. The ſolution was ſet in a quiet place, and it ſoon depoſited a ſediment, which was not ſoluble in ſpirit of wine, but readily diſſolved in diſtilled vinegar.

As it is not likely that the retailers of this noxious ſpirit, even if convinced of its pernicious effects, would deſiſt from their trade; or that the ſoldiers would give up drinking it, though well aſſured of its being the cauſe of the worſt diſeaſes, it becomes of conſequence, to aſcertain a cheap, eaſy, and effectual method of doing away the impregnation of lead, without at the ſame time injuring the ſpirit. The *vitriolic* and *muriatic* acids both precipitate the lead, uniting therewith, and forming inſoluble compounds. The vegetable *alkali* will alſo precipitate it, if diſſolved by an acid. From the trials I made, the *vitriolic* acid appeared to be the beſt ſubſtance for this purpoſe, as it precipitates the lead moſt quickly, and moſt effectually. One drop of the oil, or ſtrong ſpirit of vitriol, will precipitate rather more than three grains of *ſaccharum ſaturni*, three drops precipitating about ſeven grains. A very ſmall quantity therefore, will be ſufficient to do away the ſtrongeſt impregnation of lead, that is ever found in ſpirits. I cannot ſuppoſe that the rum, on which I made my experiments, contained more than three or four grains in a gallon, conjecturing from the deepneſs of the colour. Three drops would, therefore, do away the impregnation in two gallons; but, allowing that a little more was added than neceſſary, it would neither injure the taſte, nor quality of the ſpirit. The exact proportion of the vitriolic acid might be aſcertained, by a previous trial made upon a ſmall quantity of the ſpirit.

Charles-ſtreet, St. James's-ſquare,
Feb. 9, 1785.

NOTES,

REFERRED TO IN THE COURSE OF THE WORK.

Note A, page 23.

IF troops be ſent to the Weſt Indies for a garriſon to any of our iſlands, it will be ſufficient to diſpatch them from this country ſo, that they may arrive there any time in the months of December, or January. Six or ſeven weeks may be allowed for the voyage, and therefore they ought to ſail in the beginning of November or December. But if troops are to be ſent upon an expedition, they ought to leave this country earlier, and ſhould ſail about the end of September. The reaſons for making a difference of this kind will be allowed to be weighty.

There is but a limited time in which military operations can be carried on, if due regard be paid to the health of the troops. This time commences with November, and is terminated by April: in ſome of the iſlands, and in particular ſeaſons, the period may be a little longer, or a little ſhorter, but the variation is not conſiderable. In all countries there are times of the year more or leſs favourable for military operations, but if this obſervation be ſuppoſed to apply in the ſame limited ſenſe to the Weſt Indies as to other countries, a very erroneous notion will be formed. A campaign during the unhealthy ſeaſon is not embarraſſed merely with the greater part of the troops being ſick, but implies a total deſtruction of the army by diſeaſe in a few months. It would be foreign to the preſent ſubject to enter into any diſcuſſion, whether the nature and urgency of military ſervice can ever require ſuch ſacrifices; or, whether any conqueſt, that involves the deſtruction of the victorious troops, can be worth obtaining at ſuch a price: but as a fact, confirmed by repeated experience, it ought to be known to officers, and merits the moſt ſerious conſideration of thoſe who direct military operations in the Weſt Indies, that the deſtruction of European ſoldiers is the inevitable conſequence of a campaign in the ſickly months, which generally begin with May, and ſeldom terminate before October. It is of importance that this ſhould be known, not only for the ſake of weighing againſt the certain mortality, the value and magnitude of the object aimed at; but alſo that the neceſſary reinforcements may be ſent from Europe in time, to preſerve ſuch acquiſitions as may be made; for the mortality has been ſuch in ſome expeditions, that in a few months there has not remained of all the troops, a number ſufficient to form a garriſon capable of maintaining their conqueſts. The deſtruction of the troops, therefore, being unavoidable, if military operations are carried on at certain ſeaſons of the year, it muſt evidently be of the greateſt importance that no part of that time, in which an army can act, ſhould be loſt. It may appear to ſome that November is too early to begin military operations, for in October and November there are often many ſick. But this proceeds from the human body having been expoſed to the cauſes of ſickneſs and diſeaſe during the preceding months; for the air in November ceaſes to be prejudicial to new comers; of the truth of which I have had many proofs in the arrival of the ſhips of the Eaſt India Company in the river Ganges, in the months of October and November from Europe, the crews of which have remained very healthy. On this account, therefore, inſtead of fixing the time of ſailing for an expedition from this country to the Weſt Indies, to the beginning of November, as I did in my firſt edition, I have changed it to the end of September. Allowing ſix or ſeven weeks for a fleet to perform the voyage, they will not arrive much before the middle of November, from which time there will be nearly ſix months for the campaign.

Note B, page 27.

THE general fact, that elevation greatly diminiſhes the effects of the noxious exhalations from the ground, is commonly known and admitted; but the ſubject has not yet received ſuch particular inveſtigation as it ſeems to merit, more eſpecially as it promiſes to afford ſome inſtruction how we may avoid the cauſes of ſickneſs. It has been mentioned that houſes raiſed on pillars or arches, or in any other manner, are healthier than thoſe upon the ground. How much a circumſtance of this kind may be productive of diſeaſe was ſeen in the barracks at Spaniſh Town. They conſiſted of two floors, the firſt upon the ground, and the ſecond over the firſt. The difference in health of the men on the two floors was ſo ſtriking as to engage the attention of the Aſſembly of the iſland, and upon inveſtigation it appeared that three were taken ill on the ground floor for one on the other. The ground floor was not therefore uſed as a barrack afterwards.

Prince Rupert's bay in the iſland of Dominica is a very unhealthy place, owing to the marſhes at the bottom of the bay. One ſide of the bay is formed by a projecting head land, called Prince Rupert's head, which is elevated ground, but of unequal heights. There are ſeveral barracks, or ſtations for troops upon it, which are more or leſs healthy in proportion to their elevation. Douglas bay barracks are 110 feet above the level of the ſea, and are the moſt ſickly; Fort Shirley is 150 feet, and the royal engineers quarters 165 feet, and are leſs ſickly; the inner Cabrite, and the outer Cabrite, the firſt 430, and the ſecond 590 feet high, have been found very healthy. Theſe are ſmall elevations to produce effects ſo conſiderable; but the aſcent is ſteep, and to that in part it may be owing; for a gradual aſcent by a ſloping plain to a much greater height, would not probably produce an air ſo ſalubrious.

The town of St. George in Grenada lies low, and there is marſhy ground in the neighbourhood; the troops in ſuch ſituations have always been unhealthy. But the high grounds adjoining have been found very healthy. *Morne Cardigan* is about 500 feet high; and Richmond heights 730 feet. Theſe ſtations are very healthy, though their height be inconſiderable for a Weſt India iſland *.

The great improvement in the healthineſs of ſuch ſituations depends, on the noxious vapours and exhalations being ſo weakened by diffuſion in a great maſs of air, that they loſe their deleterious effects.

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* For theſe facts and obſervations reſpecting the ſtations mentioned in this note, and alſo for the meaſurements of their heights, I am indebted to Captain Finlay of the Royal Engineers.

In order that troops may reap the full benefit of ſuch ſituations, care ſhould be taken that they be not permitted to go down to the low grounds, for if they are, they will infallibly carry fevers up with them. One great advantage of negro troops would be, to remove all neceſſity or even pretence of ſending the European ſoldiers from ſtations of this kind; for by employing the negroes on ſuch occaſional duty as might occur in the low ground, the Europeans would not be at all expoſed to the cauſes of diſeaſe.

Note C, p. 29.

NEGROES ſuffer little from fevers or fluxes; nor do thoſe diſorders ariſe in them from labouring, or working hard, while expoſed to the ſun, even in marſhy ſituations. Their health would not ſuffer from military duty of any kind in the Weſt Indies. Were therefore black troops formed, they would be a principal means of preſerving the health and lives of the European ſoldiers, by doing all duty of fatigue; all duty in the ſun; by taking all guards in unhealthy ſituations; and by doing every kind of military ſervice, that was deſtructive of the health of Europeans.

Negroes were attached to the regiments in Jamaica, three to each company, as pioneers, and ſervants, and were found extremely uſeful, in ſo far as they ſaved the ſoldiers from certain duties of fatigue, and from being employed as ſervants by the officers; for thoſe duties which are eaſy for a ſoldier to do, as a ſervant to an officer in this country, would prove deſtruction to him in the Weſt Indies. But to receive the full benefit that might be derived from the employment of negroes, it is not enough to uſe them for pioneers and ſervants, they ſhould be employed as ſoldiers. In adopting a meaſure of this kind, there are ſome important conſiderations that preſent themſelves. The firſt and moſt material is, how negroes may be employed as ſoldiers with ſafety; a ſecond, and almoſt of equal conſequence is, in what manner they ſhould be formed into ſoldiers, ſo as to derive the greateſt poſſible advantages from them.

In a country like this, where happily no ſlavery exiſts, it is not poſſible to form an idea of that ſtate of ſociety, in which the greater part are the ſlaves and property of the few. We are equally unacquainted with the authority which the maſter neceſſarily poſſeſſes, and the parental care which he generally exerts; and we can ſtill leſs form any adequate notion of his fears, and apprehenſions, from conſpiracies and inſurrections. To ſuch as have not had experience of this ſtate of ſociety, by having been in ſome part of the world in which it exiſts, too much caution in judging, or too much diffidence in their own opinions, cannot be recommended; more particularly if their opinions are to form the baſis of new regulations, reforms, and alterations. In ſuch ſituations it is moſt deſirable to aid human judgement by the experience, and precedents of former times. The ancient republics of Greece often armed their ſlaves in caſes of great emergency, but they always made them free before they put arms in their hands. The policy, and even neceſſity of ſo doing muſt be obvious. Whenever therefore a negro becomes a ſoldier, he ſhould be made free. He will then have no temptation to combine with thoſe that are ſlaves. He ſhould be inſtructed in the principles of Chriſtianity, as the moſt compendious and moſt efficacious mode of giving moral education. He ſhould receive the ſame pay, proviſions, and allowances of every kind, as any other ſoldier. After ſerving a certain number of years, and from age becoming unfit to do the duty of a ſoldier, proviſion ſhould be made for him, either by allotting him a ſmall portion of land, or otherwiſe. With theſe regulations, there can be no doubt that, negroes would ſerve as ſoldiers with ſafety and fidelity.

To derive the greateſt benefit from their ſervices, by rendering them the means of preſerving from diſeaſe the European ſoldiers, it may be a queſtion, whether it would be better to form them into regiments, or to raiſe them by ſeparate companies, and to attach two, or more companies, to each regiment, upon their arrival in the Weſt Indies? The regiments about to leave that part of the world, might turn over their black companies to their ſucceſſors. Whichever of theſe modes be adopted, there can be no doubt that the black and European troops ſhould be ſo intermixed, that wherever there were three or four companies of the latter, there ſhould alſo be one black company; for if this be not done, and the black troops are kept together in regiments, they cannot ſave the European troops from ſuch parts of regimental duty as may be injurious to their health. Beſides this advantage from intermixing the black and white ſoldiers, there would alſo be greater ſecurity againſt the negroes attempting any innovations.

Note D, page 61.

IT is natural to aſk, have the precautions ſuggeſted, or the means recommended, to guard againſt diſeaſe, been effectual during the preſent war in the Weſt Indies? To make a full reply to this queſtion, I have not the requiſite information; but it is certain that the mortality of no former war in that quarter of the world, has gone beyond that of the preſent. Having no object in view but the inveſtigation of the truth; and judging no truth of greater importance than what relates to the health of our troops in the Weſt Indies, my reſearches have been directed chiefly to the detection of any error, or miſtake, I might have committed in treating on this ſubject, in my former edition. I cannot find, as far as I can learn, that the troops have died of different diſeaſes in the preſent war, from thoſe, which in all former wars have ſwept away the armies of Europeans, in the Weſt Indies; nor have any new means been employed to avert the mortality. When due attention can be paid to the time at which troops are ſent to the Weſt Indies; to the ſituations in which they are placed there; and to the ſeaſon of the year in which they are employed in actual ſervice, there is no reaſon to doubt, that there will be a very great improvement in their health, and a proportional diminution in their mortality.

Note E, page 87.

THE fever ſhewed no tendency to a ſpontaneous criſis, and its attacks were ſo irregular, that no judgement could be formed, either of the times of acceſſion, or remiſſion. There was no regular type to be obſerved, that could be applied to practical purpoſes; for though the fits might often be reconciled to the type of a double tertian, or a ſemitertian, yet it was done by conſidering the fits as anticipating, or poſtponing ſeveral hours, as ſuited beſt the preconceived notion; and by a little latitude in the uſe of this principle, it were eaſy to aſſign any type at pleaſure to a remittent fever. Of ſuch inquiries, though there appear nothing ſatisfactory in them, it may ſtill be ſaid, that they are productive of no harm; and that may really be the caſe, provided no preconceived notion of an expected criſis, ever occaſion the loſs, or neglect of the preſent moment; and provided the belief of a regular type do not prove a cauſe of any relaxation in attending to the ſick. The remittent fever of warm climates muſt be watched from hour to hour. The words of *Celſus*, ſpeaking of fevers of a ſimilar nature*, are extremely appoſite. "Ex his autem intelligi poteſt, ab "uno medico multos non poſſe curari: "eumque, ſi artifex eſt, idoneum eſſe, qui non "multum ab ægro recedit. Sed qui queſtui "ſurviunt, quoniam is major ex populo eſt, "libenter amplectuntur ea præcipta, quæ

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* Lib. III. Cap. 3.

"ſedulitatem non exigunt; ut in hac ipſa re. "Facile eſt enim dies vel acceſſiones numerare his quoque, qui ægrum raro vident: "ille aſſideat neceſſe eſt, qui, quod ſolum "opus eſt, viſurus eſt, quando nimis imbecillus futurus ſit, niſi cibum acceperit *." The principal object in the cure of fevers, in the time of *Celſus*, was the proper adminiſtration of food; and if that required ſuch aſſiduity, leſs ſurely is not neceſſary at this time, when we are in poſſeſſion of powerful remedies in the cure of fevers, in uſing which diligence, judgement, and unremitting attention are requiſite.

Note F, p. 134.

ON the ſubject of bile, conſidered as the cauſe of fever, it would be eaſy to ſhew how ill founded, and how inadequate to the explanation of the *phænomena*, all the opinions advanced on this ſubject are, were it deſerving of minute inveſtigation. If we advert to the antiquity of our prejudices on this head, the deep root they have taken, and their general diffuſion among the people at large, I am not ſure that they do not merit a full and particular refutation, more eſpecially in order to guard thoſe that are young in the profeſſion from errors that may be fatal. But without going at length into the ſubject, I ſhall content myſelf with ſubjoining a few reflections.

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* Lib. III. Cap. 4.

A warm climate, it is alledged, increaſes the ſecretion of bile, and renders it more acrid. There does not appear to be the ſmalleſt foundation for this aſſertion. Ships ſail within the tropics for months together, expoſed to the heat of a vertical ſun, while the crew enjoys perfect health, and there is no appearance of the ſecretion of the bile being either increaſed, or deranged thereby. The inhabitants of dry ſandy iſlands, commonly called keys, in the Weſt Indies, are very healthy, notwithſtanding the heat is intenſe in ſuch places. In healthy ſituations, not productive of remittent fever, though ever ſo hot, there is no appearance of acrimony, or redundancy of bile. The diſcharge of bile in the vomiting of remittent fever is evidently the effect, and not the cauſe of the fever. The ſtomach and bowels ſuffering ſeverely in remittent fever, communicate a degree of irritation to the liver; and the ſame thing happens in the operation of ſtrong emetics, and in ſea ſickneſs, and thence a copious diſcharge of bile.

It is further alledged, that the bile being naturally putreſcent, is rendered more putrid by a warm climate. But what are the proofs? Have not experiments, made many years ago, ſhewn, that there are none of the fluids of the human body that have leſs tendency to putrefaction than the bile? It might have been ſuppoſed, that a diſcovery ſo diametrically oppoſite to the received opinions concerning putrid bile, would have raiſed ſuſpicions againſt the whole doctrine: no, the bile is not now putrid, but warm climates produce putrefaction, and the bile being admitted to be antiſeptic, ſuch climates require a more copious ſecretion of that fluid. That a warm climate produces putrefaction in a living body is a vulgar error, derived by a falſe analogy from the effects of heat on dead animal matter. That a warm climate can have no ſuch effect muſt be evident to every one, who reflects that the heat of the human body is the ſame in all climates, and in all parts of the world. But allowing the bile, becauſe antiſeptic, to be more copious in a warm climate, why ſhould it be the cauſe of diſeaſe? Do antiſeptics produce remittent fever, or fever of any kind? There is neither conſiſtency nor probability in the doctrine; as a ſpecimen of phyſiological reaſoning it is diſreputable to men, who have had a philoſophical education; and as applicable to practice it is deleterious in an high degree. An unexperienced young man adminiſters an emetic in the retchings, and ſtrainings, that accompany remittent fever; and though the patient expire under the operation, it only calls forth the following reflection, that the quantity of putrid bile was ſo great, that there was not ſtrength to bring it up! Such miſchievous effects, of ſuppoſing the bile to be the cauſe of remittent fever, are conſiſtent with my own knowledge.

Note G, page 137.

WHEN the remittent fever is of the worſt kind, the yellowneſs of the ſkin occurs moſt frequently; but the yellow fever is neither a different diſeaſe, nor do all the ſick, even in fatal caſes, turn yellow; yet at ſuch times it has been cuſtomary to call the prevailing fever by the name of the *yellow fever*. I have ſtated, that I found no difference between them, except the addition of a jaundice; and the fever, which has of late made ſuch havock among our ſailors and ſoldiers in the Weſt Indies, appears not to be in any thing different from the remittent fever, which has at all times proved the deſtruction of European armaments, in thoſe parts of the world. The remittent fever, when of a bad kind, at all times, and in all countries, is often accompanied by jaundice. This is agreeable to the earlieſt accounts we have of Weſt India diſeaſes. The addition of jaundice to the fever, is certainly much more frequent in ſome ſeaſons than in others, and has upon all occaſions chiefly affected thoſe, who have lately arrived in the country; it is not therefore ſurpriſing, that we have heard moſt of that fatal diſeaſe, during military operations in that quarter of the world.

Note H, page 143.

IT is of the greateſt importance to be able to determine with truth how far a diſeaſe is, or is not, contagious. In military phyſick the great improvements to be made are not ſo much in the cure, as in the prevention of diſeaſes, which depends altogether upon a knowledge of their cauſes. If a diſeaſe ariſe from contagion there are ſure remedies againſt it, which are ſo well aſcertained, that while the plague, the moſt contagious and moſt fatal of all diſeaſes, commits its greateſt ravages in large cities, individuals remain in the midſt of them in perfect ſecurity, truſting to a careful ſecluſion under proper regulations. Again, if diſeaſe ariſe from the air contaminated by the foul ground of a camp, or the exhalations of a marſh, it can only be avoided by a change of ſituation, or by taking care not to come within the ſphere of activity of ſuch noxious cauſes.

Let it be ſuppoſed for a moment poſſible, that a miſtake ſhould be made in the two caſes juſt ſtated; and that the plague is not allowed to be contagious, nor the camp or remittent fever be conſidered as proceeding from their proper cauſes, but believed to depend upon contagion. It is evident that complete deſtruction to all muſt be the conſequence of ſuch an error; and in medical hiſtory, there is reaſon to fear, more examples than one of this might be produced. Conſidering the magnitude of the ſubject, ſufficient pains have not been taken to aſcertain, when diſeaſes are, or are not, contagious; when they ariſe from a cauſe generally diffuſed, or when multiplied by perſonal contagion. There are ſome plain rules that may help to guide our deciſion in ſuch caſes, which I ſhall mention ſhortly, without going much at length into the ſubject.

By a contagious diſeaſe is to be underſtood, a malady ariſing from a poiſon generated in the body of the ſick, which produces in others a ſimilar diſeaſe. This poiſon in ſome diſeaſes, as the ſmall pox, is ſufficiently apparent; in others, as the plague, or hooping cough, it almoſt eludes our ſenſes. It is peculiarly characteriſtic of ſuch diſeaſes, that perſons of all ranks, and deſcriptions, are equally affected by them. Wherever they prevail, the old inhabitants of a country ſuffer as much as

thoſe

thoſe that have arrived lately. But this is never the caſe in the yellow fever, remittent fever, or even intermittent fever, for ſuch as are ſeaſoned to the country or climate ſuffer infinitely leſs than new-comers. Again, contagious diſeaſes having gone through their courſe rarely attack the ſame perſons a ſecond time; on the contrary, diſeaſes proceeding from a cauſe generally diffuſed, and operating upon all, do almoſt conſtantly recur in the ſame perſons, not once or twice, but many times, as long as they continue expoſed to the original cauſe; thus, in camps, and marſhy ſituations, the ſick are conſtantly relapſing in remittents, and intermittents, till they change their ſituation; and there has been occaſion to obſerve already, that the mortality among ſoldiers in the Weſt Indies is, in a great meaſure, owing to theſe repeated attacks. But what may be conſidered as an *experimentum crucis*, to prove the non-exiſtence of contagion is, when the ſick leave their uſual reſidence, and go to other places which are healthy without ſpreading the diſeaſe. This conſtantly happens in the remittent fevers of the Weſt Indies; for the good effects of changing the air of the towns for that of the mountains is ſo well known, that it is very generally practiſed; but certainly without the ſlighteſt ſuſpicion of any miſchief ariſing from any contagion carried by the ſick. If we try by this rule the fever epidemic in Philadelphia, in 1793, we ſhall not pronounce it to be contagious: but our accounts of that diſeaſe are yet imperfect; and therefore it is beſt to ſuſpend our judgement. There is one more obſervation, which I ſhall add; when diſeaſe ariſes from a cauſe generally diffuſed, ſeparation from the ſick does not avail. Thus, ſhips of war have gone into a harbour in the Weſt Indies, and have had no intercourſe with thoſe on ſhore, or with the crews of other ſhips, and yet in a few days the men have been ſeized with the prevailing fever in great numbers.

If theſe obſervations be applied to the remittent or yellow fever, there will be no ground for believing either to proceed from contagion.

But allowing that we are free from all apprehenſions of contagion, it is no leſs requiſite to aſcertain the real cauſe; for the air of a marſh, or of a foul camp, may deſtroy an army almoſt as ſoon as the true plague. The remedies in ſuch caſes are obvious, and conſiſt in getting at a proper diſtance from the noxious exhalations, or removing the cauſes of them. A very ſmall ſpace frequently includes the limits of healthy and unhealthy ground. An adjoining height a few hundred feet high is often perfectly healthy. Having regard to the courſe of the winds within the tropics, ſo that the noxious vapours ſhall be carried from, and not towards an army, will often prevent or remove diſeaſe.

The nature of military ſervice may render a change of poſition, however unhealthy, highly hazardous, or altogether impracticable. Under ſuch circumſtances the attention ſhould be turned to the removal of the cauſes of diſeaſe. A ſmall marſh, which might eaſily be drained, excites frequently great ſickneſs. The diſorders ariſing from the foul ground of a camp, by moving a few hundred yards, will diſappear. I conceive it to be practicable, to remain upon the ſame ground for a long time without injury to the health, if care were taken, from the beginning of the encampment, to bury at a good depth all excrementitious matter, and to have proper receptacles under ground for the water uſed in cooking or waſhing, and alſo all remains of victuals, as bones, &c. It would further be neceſſary to provide places to receive the urine, to prevent it from being ſpread upon the ground; for that alone, when a camp is crowded, and an army remains long on the ſame ſpot, would contaminate the ground; as any one may eaſily ſatisfy himſelf, that will compute the quantity that is daily diſcharged by a given number. The urine, as well as the water uſed in cooking and waſhing, are all impregnated with animal and vegetable matter, and therefore more readily give riſe to noxious exhalations from any ground upon which they are thrown.

All towns, but for ſimilar precautions, would be ſubject to the ſame fever with camps. The drains, common ſewers, pavement, ſcavengers, &c. all contribute to prevent remittent fever; though we know from medical writers, that they have not always prevented it. We learn from Sydenham, and ſtill more diſtinctly from Morton, that the remittent fever was prevalent frequently in London in their time. The bills of mortality ſhew alſo, that formerly the dyſentery, which almoſt conſtantly appears in the ſame places and ſeaſons as the remittent fever, was annually fatal to great numbers. Of late years it has almoſt intirely diſappeared, except in ſome ſeaſons when the heat has been unuſually great. The exemption, which London now enjoys, from dyſentery and remittent fever, is chiefly to be aſcribed to the attention that is paid to draining, watering, cleaning, and paving all parts of the town. But I believe the remittent fever will ſtill at times be found to commit great havock in ſome towns, from neglecting the above precautions; and of this nature I ſuſpect the fever to have been, which proved ſo fatal in Philadelphia in 1793.

Note I, page 151.

THE poiſon producing remittent fever is no doubt of very different degrees of ſtrength, at different times.

Diſeaſes ariſing from perſonal contagion admit of little variation, in whatever way the poiſon be applied: thoſe ſlightly expoſed to it, if they do catch the diſeaſe, have it as bad as thoſe who have been expoſed in the greateſt degree, as in the plague, or ſmall pox. The caſe is quite different with the poiſon of the remittent fever. Its virulence is at all times proportioned to the approximation to its ſource. This is clearly ſeen in the health of ſhips ſtationed off a marſhy coaſt. Thoſe that are neareſt ſuffer moſt, both from the frequency and violence of the fever; thoſe that are further off ſuffer leſs, till at laſt at the diſtance of a few miles, they are perfectly healthy. The poiſon is weakened by diffuſion in air; and in proportion as it is more diffuſed, it produces a ſlighter diſeaſe. Its virulence may however be influenced by other cauſes; thus, it would appear to riſe from the ground, in ſome places, and in ſome ſeaſons, much more virulent than others, without our being able to aſſign any good reaſon for it. The various degrees of virulence in the poiſon produce equal variation in the violence of the remittent fever, which is ſometimes a moſt fatal diſeaſe, and at other times a very ſlight one. To this circumſtance are to be imputed the various, and often contradictory reports, made of the ſucceſs with which the fever has been treated, even when the ſame remedies have been employed. It is often ſlight, and will yield quickly to a doſe of phyſick. When more violent, it is ſtill readily conquered by a judicious uſe of the Peruvian bark, and proper evacuations; but it riſes under certain circumſtances to a degree of violence, that can hardly be ſaid to yield to any remedies yet known. In ſuch caſes mercury has been recommended, and given freely; and the reports of its ſucceſs are extremely favourable; but, alas! the concomitant returns of the numbers of the ſick and of the dead, in the ſame writers, do by no means confirm the high character they give to this remedy *. I do not preſume to ſay that it has no virtue in the diſeaſe, but it is certainly no ſpecific, nor is its efficacy ſo clearly eſtabliſhed, as to ſuperſede the uſe of other remedies.

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* Of twenty-ſeven recruits for the Royal Artillery, who arrived in Grenada in July 1793, twenty-ſix were ſeized with the fever, and of theſe twenty-one died before the middle of Auguſt enſuing, that is, in ſix weeks. Dr. Chiſholm had ſatisfied himſelf of the great virtues of mercury at leaſt four months before, yet this is a mortality never exceeded in any fever.—Vid. Dr. Chiſholm's Eſſay, page 97.

Note K, page 153.

IT would be curious and intereſting in the hiſtory of the remittent fever, to aſcertain the interval that may take place between expoſure to the cauſe, and the appearance of the diſeaſe.

Though I had reaſon to ſuſpect that this period might be much greater than three weeks, I had not any facts or obſervations that were deciſive on the ſubject. But in 1793 the Weſt Suffolk regiment of militia, upon being called out of their own county, were ſent in the month of Feburary to Hilſea barracks. The low, marſhy, and unhealthy ſituation of theſe barracks has been fatally known to the army ſince their firſt erection. The regiment remained there about five months. They went in all in perfect health, as might be expected in a corps raiſed from the peaſantry of one of the healthieſt counties in England, with ſcarcely a man among them exceeding twenty-four years of age. They became very ſickly, and twenty-two died of fevers before they left the barracks, which they did in the end of June. When they arrived in camp in the firſt week of July at Waterdown, in the neighbourhood of Tunbridge Wells, they brought many ſick with them, and thoſe who were well, inſtead of the florid healthy look natural to our peaſantry, looked ſallow, and as if they were come from a warm climate. From the fatigues of their march, and the duties of the camp, their ſick liſt ſoon amounted to one hundred out of five hundred; and of theſe there were thirty ill of fevers in the hoſpital. The fevers had all the characteriſtic marks of a bad remittent; great irritability of ſtomach, and violent retchings; irregular exacerbations and remiſſions; and terminations frequently unexpectedly fatal to thoſe unacquainted with the diſeaſe. During the four months of the campaign there died of fevers in this regiment twelve, a greater number than what died of all other diſeaſes put together, in the eleven other battalions, that were encamped on the ſame ground. The regiment remained weakly all the campaign, for the convaleſcents recovered their ſtrength very ſlowly; and in the month of October ſome were taken ill of the fever, who had never had it before; that is, nearly four months after they had ceaſed to be expoſed to the cauſe of the diſeaſe at Hilſea barracks. This interval was longer than any I had had an opportunity of obſerving previouſly, but what happened to the 18th regiment of foot, in the years 1783 and 1784, proves that the cauſe of fever may remain even longer in the body, and produce it's peculiar effects at the end of ſix or ſeven months.

The facts I am about to ſtate I received from Mr. Venour, ſurgeon to the regiment at the time, and at preſent upon the medical ſtaff of Great Britain: I give them in his own words.

"The 18th regiment of foot arrived from the iſland of Guernſey, where it had been ſtationed a conſiderable time, with nearly two hundred men, at Hilſea barracks, about the 22d of June 1783. They had been quartered in the town of St. Pierre during the laſt ſix months, and many of them had been encamped the preceding campaign in the Vale pariſh, a very ſwampy part of the iſland, and remarkably ſubject to agues; however on leaving the iſland there were only two men ill of agues in the regiment. They remained at Hilſea barracks until the 9th of October, during which time there were many fevers amongſt them of the low remittent type, with frequent diarrhœas and ſome dyſenteries. At the time of embarking for Gibraltar, on the 9th of October, there were ſixteen men in agues. Whilſt at Hilſea barracks, the regiment received men or recruits to make their number in all about four hundred, at the time of embarkation. I had been taught to believe, that the agues I took to ſea would vaniſh very ſhortly, and if not before, certainly ſoon after, their arrival at Gibraltar. However not one ague diſappeared whilſt on board, nor on the paſſage, which was about twenty-three days. We arrived at Gibraltar in the beginning of November, when the weather was fine and mild, and ſpring vegetation advancing very faſt. From a belief that the climate would cure the agues, very little was done in the way of medicine for the firſt month; but as they continued without abatement, the uſual remedies were employed, the chief of which was Peruvian bark, and ſome of them were removed, whilſt others continued obſtinate. During the firſt three months, ſeveral ſlight fevers terminated in intermittents, which gave way to the bark, &c. but the men remained weakly, and in like manner as thoſe who brought agues from England, that had ceaſed to be regular in their paroxyſms, had every now and then fits at irregular periods. About the latter end of January 1784, agues became frequent amongſt the men who had not before had any, and many of thoſe who had been ill formerly relapſed. The number of agues continued to increaſe in an alarming degree, in ſo much that, by the beginning of May, they amounted in all, men, women, and children, to two hundred and eighty. They aſſumed all the various types deſcribed by authors, and one, the moſt obſtinate of all, came every ſixth day. Medicines ſeemed to have very little effect, that is the bark with the uſual aromatic ſtimulants, ſudorifics, &c. for at that time I was not acquainted with the uſe of the metallic ſalts in thoſe complaints. From the beginning of May no more men were attacked, and thoſe already ill began to recover rapidly; by the end of June not an ague remained, and moſt of the men were able to return to their duty. From the above period the regiment became as healthy as the other regiments in garriſon.

"The commanding officer of the regiment had, from his notions of a warm climate, provided the men with linen waiſtcoats and breeches, which were cleaned with whiting wetted; this was generally done whilſt they were on, and the men wore them till dry. The regiment was likewiſe nearly without watchcoats. The commanding officer wiſhing to make every ſoldier able to cook, ordered a man *per* company to take that duty daily in turns. The proviſions being ſalt beef, pork, and peas, and the lot of cooking falling frequently on raw boys and recruits, the meſſes were often in a wretched condition and ſcarcely eatable; added to all theſe circumſtances, more rain fell that winter than had done in all the three winters of the ſiege, ſo that the men's cloaths were ſeldom or ever dry."

The reflections to be made from the above facts are both curious and uſeful. The 18th regiment of foot, and the Weſt Suffolk regiment of militia, after leaving Hilſea barracks, were both in ſituations where they could not contract fevers, and the regiments encamped with the latter, and in garriſon with the former, had no fevers. There cannot therefore be a doubt, that the poiſon had remained quieſcent in their bodies for four, five, and ſix months. It may be aſked, had it no effects in all that time? Certainly there were inſtances in which it did not appear to occaſion any ſenſible change in the conſtitution; but this was not always the caſe, for the men of the Weſt Suffolk had in general loſt their florid healthy look, they had loſt fleſh, and had not their uſual activity or ſtrength, as appeared by their being tired and fatigued by any exertion, even though inconſiderable. In this ſituation, getting wet in the open air proved a very ſtrong exciting cauſe of fever, as was obſerved both in the Weſt Suffolk, and 18th regiment.

Ships returning from a warm climate, particularly if they have been in harbour during the unhealthy ſeaſon, have many of their men taken ill of the remittent fever, even two or three months after being at ſea; and care ſhould be taken not to confound this fever with what is called the jail, hoſpital, or ſhip fever.

Note L, page 169.

THE Calomel was uſed in intermittent fevers in order to give greater efficacy to the bark, and not to ſuperſede the uſe of it. It might probably be adminiſtered with the ſame view in bad remittent fevers, with ſimilar good effects. It has been given by itſelf, and as a ſpecific in that diſeaſe; but the accounts before the public do not yet appear ſatisfactory. The evidence, indeed, of it's good effects are very ſtrong, but not altogether conſiſtent; for the ſucceſs of the practice of thoſe, who beſtow the higheſt commendations upon it, ſcarcely warrant ſuch encomiums; and the liſts of the deaths and recoveries of the ſick, as far as any have been laid before the public, do not give a favourable impreſſion of it's virtues. A remarkable thing is, the great quantity of Calomel that is given, and the inconſiderable operation that it produces; which is probably to be imputed to the torpid ſtate in which the bowels are, owing to the comatous ſtage of the fever. Though no ſymptom be more formidable than *coma* in this diſeaſe, yet it runs its courſe, and frequently, even when moſt alarming, terminates in a remiſſion of the fever; a circumſtance which muſt give riſe to ſome uncertainty, whether a remiſſion is to be imputed to the natural progreſs of the diſeaſe, or to the Calomel.

Note M, p. 179.

IT is a remarkable thing that in the Eaſt Indies, under the ſame latitude nearly as Jamaica, that is, at Madras and Bombay, the diſeaſe known in thoſe countries by the name of the *Liver*, or *Hepatitis*, ſhould be the moſt prevailing diſorder among Europeans, and that the ſame ſhould not be known in the iſland of Jamaica. The *Liver*, or *Hepatitis* of the Eaſt, is an acute diſeaſe, attacking often ſuddenly, and ſoon proving fatal, unleſs proper remedies be uſed againſt it. By its natural progreſs it haſtens to ſuppuration, and if the diſeaſe arrive at that ſtage, there are few to whom it does not prove fatal.

I have taken notice of the enlargements of the liver and ſpleen, which occur in Jamaica, after long continued intermittents, the ſame that are to be met with in all countries, in which intermittent fevers prevail; but they are totally different from Hepatitis, having no tendency to ſuppuration, and generally ending in dropſy. I never ſaw them except as the effects of preceding intermittent or remittent fevers; but the Hepatitis comes without any previous diſeaſe. There is pain, and often fulneſs, in the right hypochondrium, a pain on the top of the right ſhoulder, and fever. Theſe ſymptoms have a rapid progreſs to ſuppuration in the ſubſtance of the liver. Mercury is the remedy chiefly to be depended upon in the cure of the diſeaſe.

Note N, page 180.

In the ſtage of Dyſentery deſcribed page 180; and alſo where there is a complication of fever and dyſentery, and both diſeaſes are equally violent, I have of late given with advantage

vantage the Anguſtura bark [*]. After premiſing the proper purgatives, it was given in the doſe of ten or fifteen grains, in two ounces of a decoction of Peruvian bark, and repeated every four hours, taking care not to offend the ſtomach. This practice does not superſede the uſe of purgatives, which muſt ſtill be given according to the degree of griping pain, and the ſtate of the evacuations, which are to be deemed favourable, or the contrary, as they approach more or leſs to the natural feculent diſcharge of the bowels.

Note O, page 180.

Sir John Pringle gave rhubarb and calomel as the beſt purgative in the dyſentery; but he conſidered it merely as a purgative. Calomel, and mercurials in general, have of late been ſuppoſed to poſſeſs ſpecific virtues in that diſeaſe. How far they deſerve that name it is no way neceſſary to diſcuſs, but as the reſults of the practice * of giving mercury in dyſentery have frequently paſſed under my examination, it may be uſeful to ſtate a few facts, that appear to be clearly made out, leaving to time, and longer experience, the more complete elucidation of the ſubject.

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[*] See Mr. Brande's Account of the Anguſtura Bark.

Nothing certainly affords equal relief, or tends ſo much to remove the diſeaſe, as purgatives, if adminiſtered with judgement and aſſiduity. This obſervation applies to purgatives of all kinds; but I am inclined to believe that a preference is due to thoſe purgatives of which calomel forms a part; at leaſt it has appeared to me, that caſes treated in this way were ſooner cured, and that a greater proportion got well than in any other manner. It is not neceſſary that the calomel and purgative ſhould be given together; one of the beſt modes of uſing it, is to give from three to five grains of calomel, with the uſual opiate at bed time; and to give the morning following a ſolution of purging ſalts, an infuſion of ſenna with *Kali Tartariſatum*, or any other purgative; none perhaps is better than the *Mag-*

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* It was firſt recommended, I believe, by Dr. Clarke, and has been generally adopted by the ſurgeons of the ſhips in the ſervice of the Eaſt India Company.

neſia Vitriolata. When the ſymptoms are violent, particularly the griping, the purgative is given every day, and the calomel and opiate every night. Much depends upon the diligence with which the purgatives are administered; the ſick ſhould be viſited three or four times a day; and whenever the griping recurs with violence, opening medicines are the only ſure means of relief. Though any purgative medicine will, generally ſpeaking, do good, I ſhould prefer that courſe of medicine of which calomel made a part. With regard to the ſpecific effects of mercury, there are facts and obſervations that favour that opinion. It is obſerved, that as ſoon as the mouth gets ſore, the griping and other ſymptoms of the diſeaſe do conſiderably abate. Yet our experience is not quite uniform in this particular; for when the mercurial ointment is uſed, there are many caſes in which ſalivation is excited, not only without benefit, but with the appearance of precipitating the diſeaſe. When mercury has been uſed moſt ſucceſsfully, it has been given in ſuch preparations as produce purgative effects; at leaſt ſo it appears to me, from reviewing the practice of others in this diſeaſe.

Note P, page 224.

I BELIEVE the obſtinate ulcers, that occur ſo frequently in the Weſt Indies, are to be imputed to the bad habit of body produced by the gradual, and inſenſible operation of the poiſon, or cauſe of fever upon the conſtitution. I am led to this opinion, by what I had occaſion to obſerve in the Weſt Suffolk regiment of militia. While the men remained of a ſallow and unhealthy look *, ſlight cuts or accidents produced ſores exactly like thoſe, that occurred in Jamaica. The granulations were rather luxuriant, though pale, and their ſurface ſomewhat gloſſy; and the ſores were more diſpoſed to ſpread than to heal. It is true I ſaw none of them that extended to a large ſize, as they did in Jamaica; yet they had the ſame appearance, and if the conſtitutions of the men had continued to ſuffer, by remaining conſtantly expoſed to the cauſe of fever, I have no doubt the ſores would have been as bad as in the Weſt Indies.

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* See note K.

FINIS.